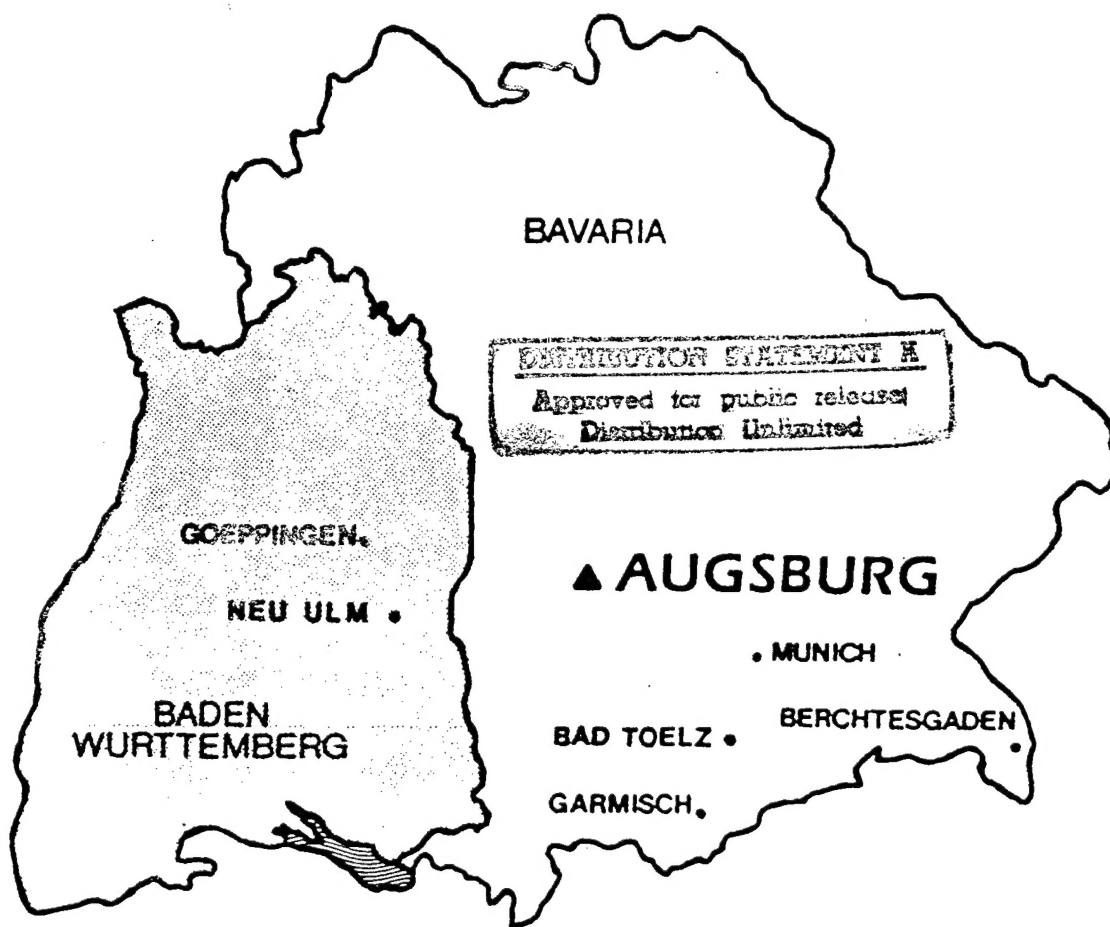
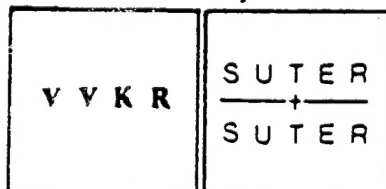


# EEAP

## PHASE III EXECUTIVE SUMMARY



Augsburg Military Community  
30 May 1986



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## EXECUTIVE SUMMARY

### I. PROJECT INTRODUCTION:

This document is the end result of the Energy Engineering Analysis Program (EEAP) at Augsburg Military Community in West Germany. This EEAP was authorized by the U.S. Department of the Army, European Division, Corps of Engineers, headquartered in Frankfurt, West Germany, under contract No. DACA-90-83-6-0023. The ultimate goal of this effort is the reduction of energy consumption in compliance with the objectives set forth in the U.S. Army Facilities Energy Plan.

The scope of services for this study defines the project in three phases of work. Phase I involves data collection for all buildings at Augsburg. The data collection phase includes utility data, determination and inspection of model buildings, assignment and review of similar buildings, and review of operating procedures. Phase II utilizes and relies heavily upon the information collected in Phase I. In this phase, energy conservation recommendations are developed to estimate related energy savings, as well as implementation costs for specific recommendations. Phase III of this project screened all energy conservation projects and provided programming documents for those projects which the community is requesting funding. By definition, any programmed project has a savings to investment ratio greater than one in compliance with the revised Energy Conservation Investment Program (ECIP) criteria dated June 1985. The end result of the three phases of work are seven packages requesting funding for several projects designed to reduce energy consumption at Augsburg Military Community.

## II. PHASE I:

Phase I of the EEAP consisted of "data gathering and inspection of the facilities in the field." During this phase, several GY areas were reviewed at this military community. Complete details of the data collection including energy use data, and all building survey data can be found in the Phase I Data Report.

### A. Buildings Surveyed:

At the Augsburg Military Community, the following GY areas were included under the contractual requirement for the EEAP:

GY 007 Gablingen Kaserne: which consists primarily of a heliport with support facilities, restricted buildings, warehouses, fire station, military police station, and condemned buildings.

GY 159 Centerville Family Housing: which consists of apartment buildings, a chapel, school buildings and a gasoline station.

GY 187 Fryar Circle Family Housing: which consists of single family, duplex and multi-story housing units.

GY 280 Flak Kaserne: which consists primarily of troop housing and support facilities, hospital, motor pool and maintenance facilities.

GY 536 Reese Barracks: which consists primarily of troop housing and support facilities, community and recreational facilities, administration and brigade headquarters offices, transportation, motor pool, and equipment maintenance facilities.

GY 572 Sheridan Kaserne: which consists primarily of troop housing and support facilities, community and recreational facilities, repair shops, warehouses, and dental facility.

GY 862 Cramerton Family Housing: which consists of apartment buildings, a heating converter building, chlorination building, and grade school building.

GY 863 Augsburg Quarter Master Supply Center: which consists primarily of the main post exchange, commissary, veterinary facility, food storage, general purpose warehouses, and guard station.

GY 864 Sullivan Heights Family Housing: which consists of apartment buildings.

The other GY areas included in the Augsburg Master Planning area that were not a part of this Scope of Work are:

GY 018 Lechfeld Training Area

GY 056 Augsburg Ammo Vehicle Park

GY 522 Bonstetten Radio Relay Facility  
GY 611 Biburg Training Area  
GY 612 Holzhausen Training Area  
GY 613 Derchinger Forest Training Area  
GY 628 Deuringen Training Area  
GY 636 Haunstetten Training Area

These areas were excluded from the Scope of Services by the EUD Project Manager due to the nature and type of buildings located in these GY areas.

There were 19 buildings surveyed at Augsburg Military Community that were designated "Annex A Buildings." These facilities were audited in great detail in order to complete a computerized analysis of current energy use, possible energy conservation opportunities and the performance of the existing heating and ventilating equipment. These Annex A Buildings surveyed at Augsburg were as follows:

GY 007 Gablingen Kaserne:  
Bldg. No. 442 Aircraft Field Maintenance Hanger

GY 159 Centerville Housing:  
Bldg. No. 591 High School

GY 187 Fryar Circle Housing:  
Bldg. No. 704 Family House  
743 Duplex Family Housing

GY 280 Flak Kaserne:  
Bldg. No. 210 ECM Club/Mess Hall  
212 Billets  
220 Maintenance Bays/Storage

GY 536 Reese Barracks:  
Bldg. No. 9 Mess Hall  
33 Morale Support Center  
51 Billets

GY 572 Sheridan Kaserne:  
Bldg. No. 101 Command Building  
123 Billets  
125 Maintenance/Bowling Facility  
134 Child Care Center  
156 Billets  
178 Workshop/Upholstering and Rug Cleaning

GY 862 Cramerton Family Housing:  
Bldg. No. 568 Apartment Building  
578 Apartment Building

GY 863 Quarter Master Supply Center:  
Bldg. No. 63 Post Exchange

All other heated buildings at Augsburg were surveyed in Phase I as "walk- through similar buildings." That is, they were surveyed to discern the differences between them and an Annex A Building that they were judged similar to. Due to the wide variety of building types at Augsburg, not all facilities could be made similar to one of the 19 Annex A Buildings at Augsburg. Since this EEAP contract encompasses six military communities, there was a total of 51 Annex A Buildings, 32 of which were located at other communities. These facilities were judged by the EUD Project Manager to be representative of all facilities on all military communities under contract. As a result, some buildings at Augsburg were judged similar to Annex A Buildings at another military community in order to provide computer simulation.

The list of these buildings at other military communities follows:

| <u>Community</u> | <u>GY</u> | <u>BLDG</u> | <u>USE</u>       |
|------------------|-----------|-------------|------------------|
| Goeppingen       | 139       | 148         | Maintenance Shop |
| Goeppingen       | 231       | 714         | Family Housing   |
| Garmisch         | 571       | 119         | Gym              |
| Garmisch         | 571       | 114         | Office/Shops     |

During the computer analysis of the energy consumption of each boiler plant, each Annex A Building was reviewed as if it existed at Augsburg, whether it did or not. That is, an Annex A Building from the Garmisch Military Community was analyzed with Augsburg weather data in order to make the similar building's analysis more accurate. Complete information on all of these buildings can be found in the Phase I Data Report.

At each building, whether reviewed as an Annex A Building or a walk-through similar building, an ECO checklist for the specific building under consideration was completed. This checklist noted over 110 Energy Conservation Opportunities (ECO) that were reviewed at the facility. Each ECO was noted as "Completed" or "Not Completed" and if not completed, as "Feasible" or "Not Feasible." Based on this checklist, all energy conservation calculations were performed after incorporating the Phase I comments from both EUD and the military community. All ECO's noted as "Not Completed," and "Feasible" were reviewed for implementation. This checklist was also verified against the current ECIP Project List and the Master Planning Documents at Augsburg so that there would be no duplication of effort for projects already recommended and slated for implementation.

## B. Energy Consumption History:

As reviewed in the Phase I Data Report, the Augsburg Military Community has steadily reduced its energy consumption since the peak year of FY 1979. By FY 1983, the total reduction since 1975 has been 5%, thus approaching the mandate established by the Department of the Army to reduce overall energy consumption by 20% from the FY 1975 levels. The energy consumption trends can be seen in the following chart from data provided by the VII Corps Headquarters in Stuttgart, West Germany:

Energy Consumption History (MIL BTU)

| FY   | Electricity | Heating Fuel | Total Fuels |
|------|-------------|--------------|-------------|
| 1975 | 482,804     | 1,212,948    | 1,695,752   |
| 1976 | 488,696     | 1,133,809    | 1,622,505   |
| 1977 | 518,091     | 1,153,830    | 1,671,921   |
| 1978 | 506,549     | 1,141,001    | 1,647,550   |
| 1979 | 512,302     | 1,229,549    | 1,741,851   |
| 1980 | 541,430     | 1,148,036    | 1,689,466   |
| 1981 | 578,098     | 1,099,015    | 1,677,113   |
| 1982 | 575,615     | 1,121,712    | 1,697,327   |
| 1983 | 587,076     | 1,018,326    | 1,605,402   |

For complete data and information on the Energy Consumption History, refer to the Phase I Data Report.

## C. Energy Conservation Efforts Since FY 1975:

The reduction in the energy consumption at Augsburg has been due to a number of factors. Perhaps the most significant has been the establishment of a Community - wide Energy Conservation Program by the Director of Engineering and Housing. This program has included an educational effort to inform every individual and each family on the Augsburg Community of the importance of energy conservation. This program ultimately affects every aspect of life at Augsburg. In addition, there has been an Energy Conservation Awards Program to recognize those individuals and groups leading the energy conservation efforts.

Since FY 1975, substantial energy conservation actions have been put into effect. These include the following measures.

1. Installation of outside air temperature reset control and time controls for space heating at Reese and Sheridan Kasernes.
2. Installation of thermostatic control valves to replace manual radiator valves in all buildings in Fryar Circle, Centerville, Cramerton and Sullivan Heights family housing.

3. Limiting indoor air temperature to minimum permissible levels.
4. Reduction of domestic hot water temperatures.
5. Installation of photocells for security lighting.
6. Elimination of outdoor lights and reduction of security lighting to minimum levels.
7. Installation of rotary time switches for lights and fans in toilets.
8. Installation of time switches for corridor lighting.
9. Repair and replacement of single pane windows with thermopane windows in all family housing areas.
10. Replace lamps with energy savings lamps.
11. Insulate attics.
12. Replace heating equipment, Bldgs. 60-62, 65, 67, 91.
13. Replace all broken windows, all Kasernes.
14. Hot water usage controls.
15. Consolidation of boiler plants #92 and 38.
16. Installation of night setback temperature control for all Kasernes.
17. Repair and replace piping insulation on all distribution lines.
18. Installation of storm windows, Reese and Sheridan Kaserne.
19. Repair and overhaul all boilers during off season.
20. Insulate roofs and walls.
21. Install insulated doors and windows.
22. Replace old and inefficient heating systems, and boiler plants.

See the Phase I Data Report for a listing of all current ECIP projects ongoing, under construction and funded.



### III. PHASE II

Phase II of EEAP consisted of "analysis of data (collected in Phase I), performance of feasibility and economic studies and the identification of proposed projects." More specifically, Phase II consisted of 1) verification of computer simulated buildings' energy consumption versus actual utility bills; 2) identification of proposed projects and calculation of savings, costs, and SIRs; and 3) deletion of projects, as requested by Augsburg Military Community and required under ECIP criteria.

#### A. Methodology:

The basis of the analysis phase of this EEAP at Augsburg is the computerized analysis of the Annex A Building at this military community and at several other communities which were judged similar to other buildings at Augsburg. As noted earlier, the calculated energy consumption of each building at Augsburg was based on the computer analysis of these facilities.

The computer program utilized for this analysis is entitled C-PARTS (Component Performance Analysis for Real Thermal Systems). This program was developed and copyrighted by VVKR Incorporated of Alexandria, Virginia and is designed to allow an accurate assessment of each energy sensitive element in an existing building. The program utilizes standard ASHRAE heat transfer methodologies and thermal resistance values for building materials from the National Bureau of Standards or ASHRAE. Since the program was specifically designed with the analysis of existing buildings in mind, it is based on an hour by hour analysis of a typical day each month, and provides outputs that can easily be compared with the actual utility consumption data of an existing facility.

In this manner, the C-PARTS analysis can be checked against a known factor, the utility consumption of the facility for accuracy. Any significant deviations between the C-PARTS output and the actual consumption point to a problem in the C-PARTS data input or analysis. As a result, the final C-PARTS outputs have been verified against real data rather than a simple estimate of energy consumption.

As reviewed earlier, the vast majority of buildings analyzed are walk-through similar buildings. Each of these facilities was made similar to an Annex A building, located either at this community or on another. For each walk-through building, a variation checklist was provided to note the differences between that building and the Annex A building judged similar to it. For example, two buildings may be similar in respect to the basic construction and use, but one has 25%

greater window area and 30% greater floor area than the other. These variations have been noted for each walk-through building in respect to its associated Annex A building. All heat transfer coefficients, U-values, are assumed equal to those for the Annex A Building, unless noted otherwise.

In the computer analysis process, all Annex A buildings associated with this military community are first analyzed with the local weather data. This is the process for all Annex A buildings, whether located at this community or simply similar to a building at this base.

After these analyses have been complete, each of the walk-through similar buildings at this community is analyzed by C-PARTS in relation to its associated Annex A building. The variations noted above are taken into account in the analysis process to derive an accurate estimation of the energy use at each individual walk-through facility.

#### B. Boiler Plant Verification Analyses:

The next step in the C-PARTS Analysis at this military community is the verification of the computed energy consumption against the actual energy consumption for the test year. There is no specific energy consumption data for each specific building. Rather, there is energy consumption data for central boiler plants, which provide heat to a number of buildings, and for electrical substations, which provide power to a number of buildings.

After the energy consumption data has been calculated for all of the Annex A buildings and the walk-through similar buildings, the facilities are all grouped according to the central plants and substations servicing them. The totals of these facility groupings are then verified against the historical energy consumption data.

There are several factors that can cause major deviations between the ASHRAE computed loads of C-PARTS and actual consumption data. These are as follows:

1. Distribution line losses and steam leaks,
2. Lack of heating system controls that cause building occupants to open excessive windows for comfort and thus increase infiltration losses,
3. Large doors that are left open for excessive time periods in repair and maintenance facilities,
4. Low boiler efficiencies due to poor or non-existent maintenance and controls.

Whenever possible, corrections for these factors were introduced, based on additional data that was collected during the Phase I survey. This data includes the ambient air conditions on the day of the survey, the number of windows and doors found open, comments on leaking pipes, doors found open, poor heating system controls, the measurement of the boiler flue gas readings, building plans and blueprints and photographs of building conditions. With this additional information, and the ability of the C-PARTS program to rapidly re-evaluate the building loads, adjustments were made to account for the infiltration and other losses to verify the computer analysis with the actual energy consumption within reasonable limits.

### C. Energy Conservation Opportunities:

The Energy Conservation Opportunities (ECOs) studies at this community was based on the Annex B requirements of the Scope of Services dated 20 January 1983. The ECO's noted in the Annex B were those required by the Army for analysis. In addition to these, however, several additional ECO's were voluntarily added to the analysis procedure to provide a complete review of all feasible energy savings measures at this community. These additional ECO's also include some requested by various reviewing agencies after Phase I Data Report was submitted. Others requested were judged outside the requirements of this contract.

The ECO's proposed for review and analysis are divided into eight major groupings according to their building system. These groups are as follows:

- 1) Building Envelope
- 2) Cooling
- 3) Heating
- 4) Lighting
- 5) Special Equipment
- 6) Temperature Controls
- 7) Ventilation
- 8) Domestic Hot Water

Within these groupings, all ECO's under each Increment of study have been reviewed and analyzed. The analysis of each ECO was performed either by the C-PARTS program or by manual calculations, based on data derived from the C-PARTS analysis and Boiler Plant Verification Analysis.

Generally speaking, the Building Envelope ECO's and Temperature Control ECO's were analyzed by re-running the C-PARTS load analysis for a specific building with revised inputs reflecting the ECO. For example, by analyzing the building first as existing, and then with additional roof insulation and comparing the two outputs, the energy savings associated with the roof insulation can easily be determined. These computer analyses were conducted on a full year's basis to obtain total savings in a year.

The manual calculations were based on data from the C-PARTS analysis of the facility or from the Boiler Plant Verification Analysis. All methods of the calculations were derived from ASHRAE or from several guidebooks provided by the U.S. Department of Energy. These are referenced with the discussion of the calculation methodology for each ECO.

The Master List of all Energy Conservation Opportunities that was reviewed at this community is as follows:

#### BUILDING ENVELOPE

- B-1 Insulation added to walls.
- B-2.1 Insulation added to existing roof.
- B-2.2 Insulation added with new roof.
- B-3 Insulation added to basement ceiling.
- B-4.1 Insulation added to attic floors.
- B-4.2 Insulation added to usable attic.
- B-5 Windows caulked.
- B-5.5 Caulk and weatherstrip windows.
- B-6 Windows weatherstripped.
- B-7 Doors weatherstripped.
- B-7.5 Caulk and weatherstrip doors.
- B-8 Storm windows installed.
- B-9 Storm doors installed.
- B-10 Double pane windows installed.
- B-11 Sun control screens or louvers added to windows.
- B-12 Solar control film added to windows.
- B-13.1 Glass area replaced with Spandrel panel
- B-13.2 Glass area replaced with glass blocks
- B-14 Automatic door closers installed.
- B-15 Doors vestibuled.
- B-16 Thermal barriers installed.
- B-17.1 Double glaze skylights.

- B-17.2 Remove existing skylights.
- B-18 Loading dock doors sealed.
- B-19 Air curtains installed.
- B-20 Thermal/solar control shades installed.

#### COOLING SYSTEMS

- C-1 Economizer systems provide free cooling during winter season.
- C-2 Dual duct or multizone systems converted to single zone systems.
- C-3 Cooling pipe lines and ductwork insulated.
- C-4 Absorption cooling equipment replaced.
- C-5 Cooling equipment is serviced, cleaned and adjusted regularly.
- C-6 Cooling of unoccupied areas is prevented.
- C-7 Variable air volume systems installed.
- C-8 Filters cleaned and inspected regularly.
- C-9 Temperature of chilled water raised.
- C-10 Solar assisted cooling equipment installed.
- C-11 Reheat coils removed.
- C-12 Heat recovered from refrigerant gas.

#### HEATING SYSTEMS

- H-1 Combustion air to boiler preheated.
- H-2 Fuel oil to boiler preheated.
- H-3 Steam condensate returned to boilers.
- H-4 Flue gas dampers installed.
- H-5 Automatic ignition pilot lights installed.
- H-6 Flue gas analysis and adjustment performed regularly.
- H-7 Combustion is monitored and adjusted regularly.
- H-8 Heating equipment converted from natural gas to oil or coal.
- H-9 Steam, condensate and hot water piping insulated.
- H-9.5 Insulate valves and fittings.
- H-10 Unnecessary humidification removed.
- H-11 Oxygen trim controls installed on boilers.

- H-12 Heat recovery systems installed.
- H-13 Solar energy heating system installed.
- H-14 Reheat coils removed.
- H-15 Temperature of hot water used for heating lowered.
- H-16 Connected to district heating.
- H-17 Turbulators installed in fire tube boilers.
- H-18 Supply and return piping installed.
- H-19 Spot heating installed.
- H-20 Fluidized Bed Combustion System

#### LIGHTING SYSTEMS

- L-1 Lighting fixtures removed.
- L-2 Lamps and/or ballasts removed from fixtures.
- L-3 Task lighting installed.
- L-4 Lower wattage lamps installed.
- L-5 Lamps and fixtures cleaned regularly.
- L-6 Exterior lighting is reduced to minimum.
- L-7 Lighting is off in unoccupied areas.
- L-8 Photocell controls installed.
- L-9 Automatic time clock controls installed.
- L-10 Fixtures relamped on schedule.
- L-11 Natural daylighting is utilized.
- L-12 Incandescent fixtures replaced with fluorescent fixtures.
- L-13 Exterior lighting replaced with low or high pressure sodium fixtures.
- L-14 Mercury vapor fixtures replaced with high pressure sodium.
- L-15 High efficiency ballasts installed.
- L-16 Power reducers installed.

### SPECIAL EQUIPMENT SYSTEMS

- S-1 Time delay switches installed on elevator motors.
- S-2 Motors and motor driven equipment are maintained and adjusted regularly.
- S-3 Time clocks installed to turn off vending machines and drinking fountains overnight and during weekends.
- S-4 Kitchen equipment and laundry equipment maintained and cleaned regularly.
- S-5 Co-generation equipment installed.
- S-6 Laundry waste air/water heat recovery.
- S-7 Kitchen waste air/water heat recovery.
- S-8 Individual metering of family housing installed.
- S-9 Peak demand load controlled.
- S-10 Electrical Load Replacement

### TEMPERATURE CONTROL

- T-1 Heating and cooling reduced to unoccupied areas.
- T-2 Time clocks added to heating and cooling systems.
- T-3 Tamperproof thermostats installed.
- T-4 Thermostats set at 78° for cooling, 65° for heating.
- T-5 Thermostats relocated from outside walls and from areas subject to drafts or direct sunlight.
- T-6 Economizer controls added to heating and cooling system.
- T-7 Temperature control system adjusted and recalibrated seasonally.
- T-8 Automatic energy management systems installed.
- T-9 Zone control implemented.
- T-10 Thermostatic radiator control valves installed.
- T-11 Night setback controls installed.
- T-12 Outside air reset installed.
- T-13 Duty cycling controls installed.
- T-14 Heating monitoring devices installed.

### VENTILATION SYSTEMS

- V-1 Outside air reduced to minimum levels.
- V-2 Exhaust systems balanced with the outside air intake systems.
- V-3 Time clocks installed to shut down exhaust systems overnight and during weekends.
- V-4 Outside air dampers sealed and adjusted to operate properly.
- V-5 Exhaust hoods are equipped with make-up air systems.
- V-6 Toilet exhaust fans wired to operate only when lights are turned on.
- V-7 Heat recovery systems installed between exhaust air and outside air.
- V-8 Maintenance Shop Exhaust system installed.

### DOMESTIC HOT WATER SYSTEMS

- W-1 Temperature of domestic hot water reduced.
- W-2 Hot water piping insulated.
- W-3 Storage tanks insulated.
- W-4.1 Eliminate hot water use.
- W-4.2 Time clocks installed to shut off water heaters overnight and during weekends.
- W-5 Flow restrictors installed in faucets and shower heads.
- W-6 Time clocks installed to shut off circulating water pumps overnight and during weekends.
- W-7 System equipment is serviced, cleaned and adjusted regularly.
- W-8 Solar hot water system installed.
- W-9 Systems decentralized.
- W-10 Hot water production supplemented by heat pump

#### D. Projects Requested for Funding:

Of the complete list of ECOs reviewed, 66 were analyzed in detail, with calculations estimating energy savings and implementation costs. Of the 66 ECOs analyzed, 16 are being requested for funding. The remaining 50 ECOs are being dropped due to insufficient SIRs or at the



request of Augsburg Milcom. A letter dated 31 January 1986 from Augsburg Milcom to VVKR outlined those projects for which funding was being requested. Of those projects, deletions were made based on ECIP criteria. ECIP criteria states that the ESIR and SIR must be greater than one for a project to be eligible for funding. See the following section for complete lists of projects and associated buildings where funding is being requested. The following section also shows the results of a life cycle cost analysis performed for each task at each building, which is the basis for funding requests.

#### IV. Phase III

Phase III of this study consists of preparing required programming documents, making any required detail changes to the Energy Report, and preparing the Executive Summary. The projects being requested for funding were formed into seven separate packages. A DD 1391 form complete with all backup material was developed for each package. The seven packages are outlined in table form as follows:

##### PROJECT LISTING FOR PACKAGE # 1: ROOF INSULATION

| ECO #  | BUILDING # | DISCOUNTED SAVINGS | INVESTMENT COST | SIR   | ESIR  |
|--------|------------|--------------------|-----------------|-------|-------|
| B- 2.1 | 1- 7- 422  | 234582.            | 210050.         | 1.120 | 1.120 |
| B- 2.1 | 1- 7- 442  | 320674.            | 215385.         | 1.490 | 1.490 |
| B- 2.1 | 1- 7- 446  | 347326.            | 233271.         | 1.490 | 1.490 |
| B- 2.1 | 1-572- 114 | 1826.              | 1712.           | 1.070 | 1.070 |
| B- 2.1 | 1-572- 157 | 33422.             | 26573.          | 1.260 | 1.260 |
| B- 2.1 | 1-572- 158 | 14611.             | 11649.          | 1.250 | 1.250 |
| B- 2.1 | 1-572- 175 | 6392.              | 5894.           | 1.080 | 1.080 |
| B- 2.1 | 1-862- 555 | 136716.            | 101238.         | 1.350 | 1.350 |
| TOTAL  |            | 1095549.           | 805772.         | 1.360 | 1.360 |

DEFINITION OF ECO # CODES:

B- 2.1 ROOF INSULATION

##### PROJECT LISTING PACKAGE # 2: BLDG. MODS. (HIGH BAY AREAS)

| ECO #  | BUILDING # | DISCOUNTED SAVINGS | INVESTMENT COST | SIR    | ESIR   |
|--------|------------|--------------------|-----------------|--------|--------|
| B-18.0 | 1- 7- 422  | 54974.             | 5943.           | 9.250  | 9.250  |
| B-18.0 | 1- 7- 440  | 148490.            | 8171.           | 18.170 | 18.170 |
| B-18.0 | 1- 7- 446  | 82511.             | 6686.           | 12.340 | 12.340 |
| B-18.0 | 1-159- 590 | 97981.             | 10400.          | 9.420  | 9.420  |
| B-18.0 | 1-280- 220 | 1283493.           | 89141.          | 14.400 | 14.400 |
| B-18.0 | 1-280- 221 | 237455.            | 14857.          | 15.980 | 15.980 |
| B-18.0 | 1-536- 13  | 201791.            | 12628.          | 15.980 | 15.980 |
| B-18.0 | 1-536- 17  | 119377.            | 15600.          | 7.650  | 7.650  |
| B-18.0 | 1-536- 18  | 85237.             | 11143.          | 7.650  | 7.650  |
| B-18.0 | 1-536- 20  | 522310.            | 32685.          | 15.980 | 15.980 |
| B-18.0 | 1-536- 21  | 585749.            | 40113.          | 14.600 | 14.600 |
| B-18.0 | 1-536- 22  | 296786.            | 18571.          | 15.980 | 15.980 |
| B-18.0 | 1-536- 23  | 542317.            | 37142.          | 14.600 | 14.600 |

| ECO #  | BUILDING # |     | DISCOUNTED<br>SAVINGS | INVESTMENT<br>COST | SIR    | ESIR   |
|--------|------------|-----|-----------------------|--------------------|--------|--------|
| B-18.0 | 1-536-     | 25  | 318338.               | 41599.             | 7.650  | 7.650  |
| B-18.0 | 1-536-     | 28  | 113668.               | 14857.             | 7.650  | 7.650  |
| B-18.0 | 1-536-     | 37  | 267128.               | 34914.             | 7.650  | 7.650  |
| B-18.0 | 1-536-     | 38  | 136447.               | 17828.             | 7.650  | 7.650  |
| B-18.0 | 1-536-     | 39  | 289906.               | 37885.             | 7.650  | 7.650  |
| B-18.0 | 1-536-     | 40  | 5709.                 | 743.               | 7.690  | 7.690  |
| B-18.0 | 1-536-     | 41  | 113668.               | 14857.             | 7.650  | 7.650  |
| B-18.0 | 1-536-     | 43  | 73876.                | 9657.              | 7.650  | 7.650  |
| B-18.0 | 1-536-     | 48  | 45501.                | 5943.              | 7.660  | 7.660  |
| B-18.0 | 1-536-     | 88  | 35212.                | 3714.              | 9.480  | 9.480  |
| B-18.0 | 1-572-     | 102 | 62393.                | 8171.              | 7.640  | 7.640  |
| B-18.0 | 1-572-     | 107 | 90716.                | 11885.             | 7.630  | 7.630  |
| B-18.0 | 1-572-     | 111 | 396877.               | 51999.             | 7.630  | 7.630  |
| B-18.0 | 1-572-     | 116 | 842829.               | 52742.             | 15.980 | 15.980 |
| B-18.0 | 1-572-     | 119 | 59331.                | 3714.              | 15.970 | 15.970 |
| B-18.0 | 1-572-     | 121 | 700434.               | 43828.             | 15.980 | 15.980 |
| B-18.0 | 1-572-     | 125 | 396877.               | 51999.             | 7.630  | 7.630  |
| B-18.0 | 1-572-     | 127 | 22714.                | 2971.              | 7.640  | 7.640  |
| B-18.0 | 1-572-     | 140 | 178059.               | 11143.             | 15.980 | 15.980 |
| B-18.0 | 1-572-     | 141 | 189925.               | 11885.             | 15.980 | 15.980 |
| B-18.0 | 1-572-     | 142 | 130594.               | 8171.              | 15.980 | 15.980 |
| B-18.0 | 1-572-     | 143 | 118728.               | 7428.              | 15.980 | 15.980 |
| B-18.0 | 1-572-     | 144 | 100172.               | 12628.             | 7.930  | 7.930  |
| B-18.0 | 1-572-     | 147 | 273054.               | 17085.             | 15.980 | 15.980 |
| B-18.0 | 1-572-     | 159 | 142460.               | 8914.              | 15.980 | 15.980 |
| B-18.0 | 1-572-     | 167 | 106861.               | 6686.              | 15.980 | 15.980 |
| B-18.0 | 1-572-     | 170 | 56784.                | 5943.              | 9.560  | 9.560  |
| B-18.0 | 1-572-     | 171 | 70980.                | 7428.              | 9.560  | 9.560  |
| B-18.0 | 1-572-     | 173 | 27975.                | 2971.              | 9.410  | 9.410  |
| B-18.0 | 1-572-     | 176 | 94995.                | 5943.              | 15.990 | 15.990 |
| B-18.0 | 1-572-     | 177 | 403648.               | 25257.             | 15.980 | 15.980 |
| B-18.0 | 1-572-     | 178 | 249321.               | 15600.             | 15.980 | 15.980 |
| B-18.0 | 1-863-     | 63  | 14266.                | 1486.              | 9.600  | 9.600  |
| B-19.1 | 1-280-     | 220 | 122000.               | 4636.              | 26.310 | 26.310 |
| B-19.1 | 1-536-     | 13  | 21632.                | 843.               | 25.660 | 25.660 |
| B-19.1 | 1-536-     | 16  | 44428.                | 1686.              | 26.350 | 26.350 |
| B-19.1 | 1-536-     | 22  | 83331.                | 2950.              | 28.240 | 28.240 |
| B-19.1 | 1-536-     | 23  | 33470.                | 1264.              | 26.470 | 26.470 |
| B-19.1 | 1-536-     | 25  | 36355.                | 2529.              | 14.380 | 14.380 |
| B-19.1 | 1-536-     | 37  | 27131.                | 2107.              | 12.870 | 12.870 |
| B-19.1 | 1-536-     | 41  | 20224.                | 1686.              | 12.000 | 12.000 |
| B-19.1 | 1-536-     | 48  | 10253.                | 843.               | 12.160 | 12.160 |
| B-19.1 | 1-536-     | 88  | 9071.                 | 421.               | 21.520 | 21.520 |
| B-19.1 | 1-572-     | 107 | 30144.                | 2107.              | 14.300 | 14.300 |
| B-19.1 | 1-572-     | 119 | 16055.                | 843.               | 19.050 | 19.050 |
| B-19.1 | 1-572-     | 159 | 18584.                | 843.               | 22.050 | 22.050 |
| B-19.1 | 1-572-     | 167 | 51692.                | 1686.              | 30.660 | 30.660 |
| TOTAL  |            |     | 10912287.             | 885398.            | 12.320 | 12.320 |

DEFINITION OF ECO # CODES:  
 B-18.0 SEAL LOADING DOCK DOORS  
 B-19.1 AIR DESTRATIFICATION

PROJECT LISTING PACKAGE # 3: HEATING SYSTEM IMPROVEMENTS

| ECO #  | BUILDING # | DISCOUNTED SAVINGS | INVESTMENT COST | SIR     | ESIR    |
|--------|------------|--------------------|-----------------|---------|---------|
| H- 1.0 | 1-536- 38  | 119076.            | 59413.          | 2.000   | 2.000   |
| H- 1.0 | 1-536- 53  | 4321.              | 2492.           | 1.730   | 1.730   |
| H- 1.0 | 1-536-2027 | 3056.              | 2492.           | 1.230   | 1.230   |
| H- 9.0 | 1- 7- 421  | 18262.             | 9789.           | 1.870   | 1.870   |
| H- 9.0 | 1- 7- 441  | 108211.            | 37300.          | 2.900   | 2.900   |
| H- 9.0 | 1- 7- 445  | 23409.             | 9831.           | 2.380   | 2.380   |
| H- 9.0 | 1-280- 207 | 83555.             | 19641.          | 4.250   | 4.250   |
| H- 9.0 | 1-280- 212 | 36070.             | 10031.          | 3.600   | 3.600   |
| H- 9.0 | 1-280- 215 | 99706.             | 23307.          | 4.280   | 4.280   |
| H- 9.0 | 1-280- 222 | 17259.             | 4573.           | 3.770   | 3.770   |
| H- 9.0 | 1-536- 3   | 126839.            | 49533.          | 2.560   | 2.560   |
| H- 9.0 | 1-536- 20  | 3561.              | 759.            | 4.690   | 4.690   |
| H- 9.0 | 1-536- 21  | 21362.             | 5521.           | 3.870   | 3.870   |
| H- 9.0 | 1-536- 38  | 186727.            | 157577.         | 1.180   | 1.180   |
| H- 9.0 | 1-536- 73  | 69218.             | 15868.          | 4.360   | 4.360   |
| H- 9.0 | 1-572- 109 | 229856.            | 191411.         | 1.200   | 1.200   |
| H- 9.0 | 1-572- 132 | 7060.              | 2592.           | 2.720   | 2.720   |
| H- 9.0 | 1-572- 146 | 7214.              | 1897.           | 3.800   | 3.800   |
| H- 9.0 | 1-572- 150 | 34341.             | 18313.          | 1.880   | 1.880   |
| H- 9.0 | 1-572- 152 | 18993.             | 17849.          | 1.060   | 1.060   |
| H- 9.0 | 1-572- 160 | 94696.             | 89141.          | 1.060   | 1.060   |
| H- 9.0 | 1-572- 167 | 83281.             | 20483.          | 4.070   | 4.070   |
| H- 9.0 | 1-572- 181 | 4426.              | 1538.           | 2.880   | 2.880   |
| H- 9.0 | 1-863- 92  | 557865.            | 434209.         | 1.280   | 1.280   |
| H- 9.5 | 1- 7- 421  | 76149.             | 1682.           | 45.280  | 45.280  |
| H- 9.5 | 1- 7- 441  | 57073.             | 1460.           | 39.080  | 39.080  |
| H- 9.5 | 1- 7- 445  | 103366.            | 1637.           | 63.130  | 63.130  |
| H- 9.5 | 1-280- 207 | 214960.            | 2700.           | 79.630  | 79.630  |
| H- 9.5 | 1-280- 212 | 187839.            | 2478.           | 75.800  | 75.800  |
| H- 9.5 | 1-280- 215 | 221293.            | 3142.           | 70.430  | 70.430  |
| H- 9.5 | 1-280- 222 | 41093.             | 1372.           | 29.950  | 29.950  |
| H- 9.5 | 1-536- 3   | 333033.            | 3275.           | 101.700 | 101.700 |
| H- 9.5 | 1-536- 20  | 45932.             | 1372.           | 33.480  | 33.480  |
| H- 9.5 | 1-536- 21  | 72198.             | 1637.           | 44.090  | 44.090  |
| H- 9.5 | 1-536- 38  | 240727.            | 4779.           | 50.370  | 50.370  |
| H- 9.5 | 1-536- 73  | 207381.            | 1637.           | 126.650 | 126.650 |
| H- 9.5 | 1-572- 109 | 237536.            | 5311.           | 44.730  | 44.730  |

| ECO #  | BUILDING # | DISCOUNTED SAVINGS | INVESTMENT COST | SIR    | ESIR   |
|--------|------------|--------------------|-----------------|--------|--------|
| H- 9.5 | 1-572- 132 | 26872.             | 1283.           | 20.940 | 20.940 |
| H- 9.5 | 1-572- 146 | 41001.             | 1283.           | 31.950 | 31.950 |
| H- 9.5 | 1-572- 152 | 70543.             | 2080.           | 33.920 | 33.920 |
| H- 9.5 | 1-572- 160 | 177977.            | 3009.           | 59.140 | 59.140 |
| H- 9.5 | 1-572- 167 | 68579.             | 1460.           | 46.960 | 46.960 |
| H- 9.5 | 1-572- 181 | 30349.             | 1372.           | 22.120 | 22.120 |
| H- 9.5 | 1-863- 92  | 996429.            | 16109.          | 61.860 | 61.860 |
| W- 2.0 | 1- 7- 440  | 4475.              | 369.            | 12.130 | 12.130 |
| W- 2.0 | 1-280- 201 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-280- 202 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-280- 203 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-280- 210 | 3561.              | 369.            | 9.660  | 9.660  |
| W- 2.0 | 1-280- 211 | 3561.              | 369.            | 9.660  | 9.660  |
| W- 2.0 | 1-280- 212 | 3561.              | 369.            | 9.660  | 9.660  |
| W- 2.0 | 1-280- 213 | 3561.              | 369.            | 9.660  | 9.660  |
| W- 2.0 | 1-280- 214 | 3540.              | 369.            | 9.600  | 9.600  |
| W- 2.0 | 1-280- 215 | 3540.              | 369.            | 9.600  | 9.600  |
| W- 2.0 | 1-280- 220 | 3540.              | 369.            | 9.600  | 9.600  |
| W- 2.0 | 1-536- 8   | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-536- 10  | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-536- 18  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 20  | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-536- 25  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 28  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 30  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 31  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 32  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 34  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 35  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 37  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 38  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 39  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 40  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 43  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 45  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 46  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 47  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 49  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 55  | 2060.              | 369.            | 5.590  | 5.590  |
| W- 2.0 | 1-536- 88  | 2529.              | 369.            | 6.860  | 6.860  |
| W- 2.0 | 1-572- 101 | 1975.              | 369.            | 5.350  | 5.350  |
| W- 2.0 | 1-572- 104 | 1975.              | 369.            | 5.350  | 5.350  |
| W- 2.0 | 1-572- 106 | 1975.              | 369.            | 5.350  | 5.350  |
| W- 2.0 | 1-572- 108 | 1975.              | 369.            | 5.350  | 5.350  |
| W- 2.0 | 1-572- 111 | 1975.              | 369.            | 5.350  | 5.350  |
| W- 2.0 | 1-572- 114 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-572- 115 | 3927.              | 369.            | 10.650 | 10.650 |

| ECO #  | BUILDING # | DISCOUNTED SAVINGS | INVESTMENT COST | SIR    | ESIR   |
|--------|------------|--------------------|-----------------|--------|--------|
| W- 2.0 | 1-572- 116 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-572- 120 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-572- 121 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-572- 122 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-572- 123 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-572- 124 | 1975.              | 369.            | 5.350  | 5.350  |
| W- 2.0 | 1-572- 125 | 1975.              | 369.            | 5.350  | 5.350  |
| W- 2.0 | 1-572- 126 | 1975.              | 369.            | 5.350  | 5.350  |
| W- 2.0 | 1-572- 128 | 1975.              | 369.            | 5.350  | 5.350  |
| W- 2.0 | 1-572- 131 | 1975.              | 369.            | 5.350  | 5.350  |
| W- 2.0 | 1-572- 132 | 2634.              | 369.            | 7.140  | 7.140  |
| W- 2.0 | 1-572- 135 | 1975.              | 369.            | 5.350  | 5.350  |
| W- 2.0 | 1-572- 140 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-572- 141 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-572- 142 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-572- 143 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-572- 144 | 2146.              | 369.            | 5.820  | 5.820  |
| W- 2.0 | 1-572- 145 | 3561.              | 369.            | 9.660  | 9.660  |
| W- 2.0 | 1-572- 147 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-572- 180 | 3927.              | 369.            | 10.650 | 10.650 |
| W- 2.0 | 1-572- 181 | 2529.              | 369.            | 6.860  | 6.860  |
| W- 2.0 | 1-572- 182 | 2529.              | 369.            | 6.860  | 6.860  |
| W- 2.0 | 1-572- 183 | 2634.              | 369.            | 7.140  | 7.140  |
| W- 2.0 | 1-572- 184 | 2529.              | 369.            | 6.860  | 6.860  |
| W- 2.0 | 1-863- 57  | 2750.              | 369.            | 7.460  | 7.460  |
| W- 2.0 | 1-863- 60  | 2750.              | 369.            | 7.460  | 7.460  |
| W- 3.0 | 1- 7- 440  | 457.               | 56.             | 8.180  | 8.180  |
| W- 3.0 | 1-159- 590 | 105.               | 77.             | 1.370  | 1.370  |
| W- 3.0 | 1-280- 203 | 4475.              | 666.            | 6.720  | 6.720  |
| W- 3.0 | 1-280- 210 | 6392.              | 1792.           | 3.570  | 3.570  |
| W- 3.0 | 1-280- 211 | 7853.              | 1301.           | 6.030  | 6.030  |
| W- 3.0 | 1-280- 212 | 8858.              | 1468.           | 6.030  | 6.030  |
| W- 3.0 | 1-280- 213 | 8492.              | 1409.           | 6.030  | 6.030  |
| W- 3.0 | 1-280- 214 | 19282.             | 3171.           | 6.080  | 6.080  |
| W- 3.0 | 1-280- 215 | 11274.             | 1857.           | 6.070  | 6.070  |
| W- 3.0 | 1-280- 224 | 91.                | 77.             | 1.190  | 1.190  |
| W- 3.0 | 1-536- 10  | 913.               | 491.            | 1.860  | 1.860  |
| W- 3.0 | 1-536- 30  | 86.                | 77.             | 1.120  | 1.120  |
| W- 3.0 | 1-536- 31  | 86.                | 77.             | 1.120  | 1.120  |
| W- 3.0 | 1-536- 46  | 4207.              | 1216.           | 3.460  | 3.460  |
| W- 3.0 | 1-536- 47  | 2318.              | 1165.           | 1.990  | 1.990  |
| W- 3.0 | 1-572- 115 | 7945.              | 1195.           | 6.650  | 6.650  |
| W- 3.0 | 1-572- 116 | 822.               | 448.            | 1.840  | 1.840  |
| W- 3.0 | 1-572- 118 | 5479.              | 1387.           | 3.950  | 3.950  |
| W- 3.0 | 1-572- 120 | 8675.              | 1301.           | 6.670  | 6.670  |
| W- 3.0 | 1-572- 121 | 731.               | 406.            | 1.800  | 1.800  |
| W- 3.0 | 1-572- 122 | 9680.              | 1451.           | 6.670  | 6.670  |

| ECO #  | BUILDING # | DISCOUNTED SAVINGS | INVESTMENT COST | SIR   | ESIR  |
|--------|------------|--------------------|-----------------|-------|-------|
| W- 3.0 | 1-572- 123 | 8401.              | 1259.           | 6.670 | 6.670 |
| W- 3.0 | 1-572- 124 | 1030.              | 299.            | 3.440 | 3.440 |
| W- 3.0 | 1-572- 126 | 4484.              | 1301.           | 3.450 | 3.450 |
| W- 3.0 | 1-572- 128 | 4484.              | 1301.           | 3.450 | 3.450 |
| W- 3.0 | 1-572- 130 | 2938.              | 853.            | 3.440 | 3.440 |
| W- 3.0 | 1-572- 131 | 4484.              | 1301.           | 3.450 | 3.450 |
| W- 3.0 | 1-572- 132 | 211.               | 171.            | 1.230 | 1.230 |
| W- 3.0 | 1-572- 165 | 2404.              | 1131.           | 2.130 | 2.130 |
| W- 3.0 | 1-572- 170 | 105.               | 77.             | 1.370 | 1.370 |
| W- 3.0 | 1-572- 171 | 105.               | 77.             | 1.370 | 1.370 |
| W- 3.0 | 1-572- 180 | 4840.              | 1238.           | 3.910 | 3.910 |
| W- 3.0 | 1-572- 181 | 2318.              | 542.            | 4.280 | 4.280 |
| W- 3.0 | 1-572- 182 | 2213.              | 512.            | 4.320 | 4.320 |
| W- 3.0 | 1-572- 183 | 2318.              | 533.            | 4.350 | 4.350 |
| W- 3.0 | 1-572- 184 | 5269.              | 1216.           | 4.330 | 4.330 |
| TOTAL  |            | 5751867.           | 1301891.        | 4.418 | 4.418 |

DEFINITION OF ECO CODES:

H- 1.0 PREHEAT BOILER COMBUSTION AIR  
H- 9.0 INSULATE PIPES  
H- 9.5 INSULATE VALVES & FITTINGS  
W- 2.0 INSULATE DOMESTIC HOT WATER LINES  
W- 3.0 INSULATE STORAGE TANKS

PROJECT LISTING PACKAGE # 4: HVAC & ELECTRICAL MODS.

| ECO #  | BUILDING # | DISCOUNTED SAVINGS | INVESTMENT COST | SIR    | ESIR   |
|--------|------------|--------------------|-----------------|--------|--------|
| H-19.0 | 1-280- 220 | 352210.            | 29080.          | 12.110 | 12.110 |
| H-19.0 | 1-536- 13  | 75613.             | 7270.           | 10.400 | 10.400 |
| H-19.0 | 1-536- 16  | 33607.             | 3635.           | 9.240  | 9.240  |
| H-19.0 | 1-536- 22  | 65827.             | 4847.           | 13.580 | 13.580 |
| H-19.0 | 1-536- 23  | 266143.            | 21811.          | 12.200 | 12.200 |
| H-19.0 | 1-536- 25  | 96798.             | 21811.          | 4.440  | 4.440  |
| H-19.0 | 1-536- 41  | 47096.             | 13329.          | 3.530  | 3.530  |
| H-19.0 | 1-536- 88  | 23907.             | 4847.           | 4.930  | 4.930  |
| H-19.0 | 1-572- 107 | 13939.             | 3635.           | 3.830  | 3.830  |
| H-19.0 | 1-572- 111 | 50076.             | 9694.           | 5.170  | 5.170  |
| H-19.0 | 1-572- 116 | 79210.             | 6059.           | 13.070 | 13.070 |
| H-19.0 | 1-572- 119 | 12606.             | 1212.           | 10.400 | 10.400 |
| H-19.0 | 1-572- 124 | 18393.             | 6059.           | 3.040  | 3.040  |

| ECO #  | BUILDING # | DISCOUNTED<br>SAVINGS | INVESTMENT<br>COST | SIR    | ESIR   |
|--------|------------|-----------------------|--------------------|--------|--------|
| H-19.0 | 1-572- 147 | 123745.               | 10906.             | 11.350 | 11.350 |
| H-19.0 | 1-572- 159 | 64943.                | 6059.              | 10.720 | 10.720 |
| H-19.0 | 1-572- 167 | 50617.                | 3635.              | 13.920 | 13.920 |
| H-19.0 | 1-572- 170 | 54314.                | 10906.             | 4.980  | 4.980  |
| H-19.0 | 1-572- 173 | 23771.                | 4847.              | 4.900  | 4.900  |
| H-19.0 | 1-572- 176 | 118728.               | 10906.             | 10.890 | 10.890 |
| H-19.0 | 1-572- 177 | 245306.               | 18176.             | 13.500 | 13.500 |
| L-12.0 | 1-159- 590 | 5255.                 | 1314.              | 4.000  | 4.000  |
| L-12.0 | 1-280- 221 | 17181.                | 5120.              | 3.360  | 3.360  |
| L-12.0 | 1-280- 223 | 5950.                 | 1722.              | 3.460  | 3.460  |
| L-12.0 | 1-536- 18  | 5294.                 | 1042.              | 5.080  | 5.080  |
| L-12.0 | 1-536- 33  | 62232.                | 10738.             | 5.800  | 5.800  |
| L-12.0 | 1-536- 36  | 4347.                 | 1042.              | 4.170  | 4.170  |
| L-12.0 | 1-572- 107 | 24614.                | 6071.              | 4.050  | 4.050  |
| L-12.0 | 1-572- 109 | 8250.                 | 2039.              | 4.050  | 4.050  |
| L-12.0 | 1-572- 112 | 27748.                | 4531.              | 6.120  | 6.120  |
| L-12.0 | 1-572- 114 | 6820.                 | 1994.              | 3.420  | 3.420  |
| L-12.0 | 1-572- 123 | 16108.                | 3806.              | 4.230  | 4.230  |
| L-12.0 | 1-572- 127 | 5026.                 | 1223.              | 4.110  | 4.110  |
| L-12.0 | 1-572- 132 | 29720.                | 7748.              | 3.840  | 3.840  |
| L-12.0 | 1-572- 135 | 31651.                | 5165.              | 6.130  | 6.130  |
| L-12.0 | 1-572- 145 | 1976.                 | 544.               | 3.640  | 3.640  |
| L-12.0 | 1-572- 163 | 17805.                | 2900.              | 6.140  | 6.140  |
| L-12.0 | 1-572- 168 | 4843.                 | 770.               | 6.290  | 6.290  |
| L-12.0 | 1-572- 173 | 5751.                 | 1495.              | 3.850  | 3.850  |
| L-12.0 | 1-572- 175 | 10158.                | 2401.              | 4.230  | 4.230  |
| L-12.0 | 1-572- 176 | 11029.                | 3262.              | 3.380  | 3.380  |
| L-12.0 | 1-572- 177 | 20199.                | 6026.              | 3.350  | 3.350  |
| L-12.0 | 1-572- 178 | 6558.                 | 1903.              | 3.450  | 3.450  |
| L-12.0 | 1-572- 180 | 25075.                | 5981.              | 4.190  | 4.190  |
| L-12.0 | 1-862- 555 | 11621.                | 3036.              | 3.830  | 3.830  |
| L-12.0 | 1-863- 62  | 59260.                | 15722.             | 3.770  | 3.770  |
| L-12.0 | 1-863- 65  | 69139.                | 18350.             | 3.770  | 3.770  |
| L-12.0 | 1-863- 66  | 32509.                | 8609.              | 3.780  | 3.780  |
| L-12.0 | 1-863- 67  | 69362.                | 18440.             | 3.760  | 3.760  |
| L-12.0 | 1-863- 95  | 1013.                 | 227.               | 4.470  | 4.470  |
| S- 7.0 | 1-280- 203 | 50224.                | 16364.             | 3.070  | 3.070  |
| S- 7.0 | 1-280- 210 | 559499.               | 32727.             | 17.100 | 17.100 |
| S- 7.0 | 1-280- 215 | 199489.               | 32727.             | 6.100  | 6.100  |
| S- 7.0 | 1-536- 35  | 25670.                | 16364.             | 1.570  | 1.570  |
| S- 7.0 | 1-536- 53  | 21603.                | 16364.             | 1.320  | 1.320  |
| S- 7.0 | 1-572- 118 | 335864.               | 32727.             | 10.260 | 10.260 |
| S- 7.0 | 1-572- 158 | 546167.               | 32727.             | 16.690 | 16.690 |
| S- 7.0 | 1-572- 175 | 63283.                | 16364.             | 3.870  | 3.870  |
| S- 7.0 | 1-572- 180 | 293767.               | 32727.             | 8.980  | 8.980  |
| S- 7.0 | 1-572- 181 | 25080.                | 16364.             | 1.530  | 1.530  |
| S- 7.0 | 1-572- 182 | 22551.                | 16364.             | 1.380  | 1.380  |



| ECO #  | BUILDING # | DISCOUNTED<br>SAVINGS | INVESTMENT<br>COST | SIR    | ESIR   |
|--------|------------|-----------------------|--------------------|--------|--------|
| S- 7.0 | 1-572- 183 | 24132.                | 16364.             | 1.470  | 1.470  |
| T- 2.0 | 1-536- 8   | 8689.                 | 1396.              | 6.220  | 6.220  |
| T- 2.0 | 1-536- 10  | 8689.                 | 1396.              | 6.220  | 6.220  |
| T- 2.0 | 1-536- 13  | 19453.                | 1396.              | 13.930 | 13.930 |
| T- 2.0 | 1-536- 17  | 37249.                | 1396.              | 26.680 | 26.680 |
| T- 2.0 | 1-536- 20  | 19972.                | 1396.              | 14.310 | 14.310 |
| T- 2.0 | 1-536- 33  | 31385.                | 1396.              | 22.480 | 22.480 |
| T- 2.0 | 1-536- 34  | 3731.                 | 1396.              | 2.670  | 2.670  |
| T- 2.0 | 1-536- 35  | 15148.                | 1396.              | 10.85  | 10.850 |
| T- 2.0 | 1-536- 38  | 98180.                | 1396.              | 70.320 | 70.320 |
| T- 2.0 | 1-536- 39  | 114572.               | 1396.              | 82.060 | 82.060 |
| T- 2.0 | 1-536- 44  | 2374.                 | 1396.              | 1.700  | 1.700  |
| T- 2.0 | 1-536- 47  | 46801.                | 1396.              | 33.520 | 33.520 |
| T- 2.0 | 1-536- 68  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 69  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 70  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 71  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 72  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 73  | 5123.                 | 1396.              | 3.670  | 3.670  |
| T- 2.0 | 1-536- 74  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 75  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 76  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 78  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 80  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 83  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 84  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 85  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 86  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 87  | 4344.                 | 1396.              | 3.110  | 3.110  |
| T- 2.0 | 1-536- 88  | 15170.                | 1396.              | 10.870 | 10.870 |
| T- 2.0 | 1-572- 101 | 26344.                | 1396.              | 18.870 | 18.870 |
| T- 2.0 | 1-572- 104 | 17714.                | 1396.              | 12.690 | 12.690 |
| T- 2.0 | 1-572- 105 | 13687.                | 1396.              | 9.800  | 9.800  |
| T- 2.0 | 1-572- 106 | 82368.                | 1396.              | 59.000 | 59.000 |
| T- 2.0 | 1-572- 107 | 43253.                | 1396.              | 30.980 | 30.980 |
| T- 2.0 | 1-572- 108 | 70967.                | 1396.              | 50.830 | 50.830 |
| T- 2.0 | 1-572- 112 | 17883.                | 1396.              | 12.810 | 12.810 |
| T- 2.0 | 1-572- 113 | 18901.                | 1396.              | 13.540 | 13.540 |
| T- 2.0 | 1-572- 114 | 11088.                | 1396.              | 7.940  | 7.940  |
| T- 2.0 | 1-572- 118 | 47919.                | 1396.              | 34.320 | 34.320 |
| T- 2.0 | 1-572- 119 | 19518.                | 1396.              | 13.980 | 13.980 |
| T- 2.0 | 1-572- 127 | 10270.                | 1396.              | 7.360  | 7.360  |
| T- 2.0 | 1-572- 133 | 6054.                 | 1396.              | 4.340  | 4.340  |
| T- 2.0 | 1-572- 134 | 21740.                | 1396.              | 15.570 | 15.570 |
| T- 2.0 | 1-572- 135 | 23901.                | 1396.              | 17.120 | 17.120 |
| T- 2.0 | 1-572- 145 | 3372.                 | 1396.              | 2.420  | 2.420  |
| T- 2.0 | 1-572- 158 | 14979.                | 1396.              | 10.730 | 10.730 |

| ECO #  | BUILDING # | DISCOUNTED<br>SAVINGS | INVESTMENT<br>COST | SIR    | ESIR   |
|--------|------------|-----------------------|--------------------|--------|--------|
| T- 2.0 | 1-572- 162 | 5641.                 | 1396.              | 4.040  | 4.040  |
| T- 2.0 | 1-572- 165 | 11474.                | 1396.              | 8.220  | 8.220  |
| T- 2.0 | 1-572- 170 | 10577.                | 1396.              | 7.580  | 7.580  |
| T- 2.0 | 1-572- 171 | 12596.                | 1396.              | 9.020  | 9.020  |
| T- 2.0 | 1-572- 175 | 26975.                | 1396.              | 19.320 | 19.320 |
| T- 2.0 | 1-572- 176 | 42537.                | 1396.              | 30.470 | 30.470 |
| T- 2.0 | 1-572- 177 | 54338.                | 1396.              | 38.920 | 38.920 |
| T- 2.0 | 1-572- 178 | 46363.                | 1396.              | 33.210 | 33.210 |
| T- 2.0 | 1-863- 91  | 79607.                | 1396.              | 57.020 | 57.020 |
| T- 2.0 | 1-863- 95  | 3304.                 | 1396.              | 2.370  | 2.370  |
| W- 6.0 | 1- 7- 422  | 632.                  | 137.               | 4.610  | 4.610  |
| W- 6.0 | 1- 7- 445  | 341.                  | 137.               | 2.490  | 2.490  |
| W- 6.0 | 1-280- 208 | 655.                  | 137.               | 4.780  | 4.780  |
| W- 6.0 | 1-280- 209 | 175.                  | 137.               | 1.280  | 1.280  |
| W- 6.0 | 1-280- 210 | 1458.                 | 274.               | 5.320  | 5.320  |
| W- 6.0 | 1-536- 3   | 829.                  | 274.               | 3.030  | 3.030  |
| W- 6.0 | 1-536- 4   | 894.                  | 137.               | 6.530  | 6.530  |
| W- 6.0 | 1-536- 9   | 914.                  | 137.               | 6.670  | 6.670  |
| W- 6.0 | 1-536- 10  | 240.                  | 137.               | 1.750  | 1.750  |
| W- 6.0 | 1-536- 25  | 362.                  | 137.               | 2.640  | 2.640  |
| W- 6.0 | 1-536- 31  | 147.                  | 137.               | 1.070  | 1.070  |
| W- 6.0 | 1-536- 33  | 853.                  | 137.               | 6.220  | 6.220  |
| W- 6.0 | 1-536- 34  | 158.                  | 137.               | 1.160  | 1.160  |
| W- 6.0 | 1-536- 35  | 204.                  | 137.               | 1.490  | 1.490  |
| W- 6.0 | 1-536- 42  | 204.                  | 137.               | 1.490  | 1.490  |
| W- 6.0 | 1-536- 46  | 520.                  | 137.               | 3.800  | 3.800  |
| W- 6.0 | 1-536- 47  | 317.                  | 137.               | 2.310  | 2.310  |
| W- 6.0 | 1-572- 102 | 204.                  | 137.               | 1.490  | 1.490  |
| W- 6.0 | 1-572- 103 | 317.                  | 137.               | 2.310  | 2.310  |
| W- 6.0 | 1-572- 106 | 373.                  | 137.               | 2.720  | 2.720  |
| W- 6.0 | 1-572- 108 | 362.                  | 137.               | 2.640  | 2.640  |
| W- 6.0 | 1-572- 111 | 859.                  | 274.               | 3.140  | 3.140  |
| W- 6.0 | 1-572- 116 | 1608.                 | 274.               | 5.870  | 5.870  |
| W- 6.0 | 1-572- 118 | 849.                  | 137.               | 6.200  | 6.200  |
| W- 6.0 | 1-572- 121 | 1484.                 | 274.               | 5.420  | 5.420  |
| W- 6.0 | 1-572- 132 | 508.                  | 137.               | 3.710  | 3.710  |
| W- 6.0 | 1-572- 159 | 175.                  | 137.               | 1.280  | 1.280  |
| W- 6.0 | 1-572- 165 | 317.                  | 137.               | 2.310  | 2.310  |
| W- 6.0 | 1-572- 166 | 240.                  | 137.               | 1.750  | 1.750  |
| W- 6.0 | 1-572- 171 | 184.                  | 137.               | 1.350  | 1.350  |
| W- 6.0 | 1-863- 60  | 1459.                 | 274.               | 5.320  | 5.320  |
| TOTAL  |            | 5833580.              | 703373.            | 8.294  | 8.294  |

DEFINITION OF ECO CODES:

H-19.0 RADIANT SPOT HEATERS

L-12.0 REPLACE INCAND. LIGHTS W/ FLOUR.

S- 7.0 KITCHEN HOOD HEAT RECOVERY

T- 2.0 HEATING SYSTEM TIME CLOCKS

W- 6.0 TIME CLOCKS FOR DOM. WATER PUMPS

PROJECT LISTING PACKAGE # 5: TEMPERATURE CONTROLS

| ECO #  | BUILDING # | DISCOUNTED<br>SAVINGS | INVESTMENT<br>COST | SIR    | ESIR   |
|--------|------------|-----------------------|--------------------|--------|--------|
| T-10.0 | 1- 7- 422  | 43609.                | 3021.              | 14.440 | 14.440 |
| T-10.0 | 1- 7- 440  | 14525.                | 891.               | 16.290 | 16.290 |
| T-10.0 | 1- 7- 442  | 59630.                | 3120.              | 19.110 | 19.110 |
| T-10.0 | 1- 7- 445  | 19026.                | 1288.              | 14.780 | 14.780 |
| T-10.0 | 1- 7- 446  | 64587.                | 3368.              | 19.180 | 19.180 |
| T-10.0 | 1-159- 527 | 2227.                 | 495.               | 4.500  | 4.500  |
| T-10.0 | 1-159- 590 | 4523.                 | 446.               | 10.150 | 10.150 |
| T-10.0 | 1-280- 201 | 14006.                | 1337.              | 10.470 | 10.470 |
| T-10.0 | 1-280- 202 | 7003.                 | 693.               | 10.100 | 10.100 |
| T-10.0 | 1-280- 203 | 14006.                | 1337.              | 10.470 | 10.470 |
| T-10.0 | 1-280- 207 | 161589.               | 9459.              | 17.080 | 17.080 |
| T-10.0 | 1-280- 208 | 35664.                | 2129.              | 16.750 | 16.750 |
| T-10.0 | 1-280- 209 | 3566.                 | 446.               | 8.000  | 8.000  |
| T-10.0 | 1-280- 210 | 36961.                | 4556.              | 8.110  | 8.110  |
| T-10.0 | 1-280- 211 | 26715.                | 3318.              | 8.050  | 8.050  |
| T-10.0 | 1-280- 212 | 31125.                | 3863.              | 8.060  | 8.060  |
| T-10.0 | 1-280- 213 | 29568.                | 3665.              | 8.070  | 8.070  |
| T-10.0 | 1-280- 214 | 36010.                | 4507.              | 7.990  | 7.990  |
| T-10.0 | 1-280- 215 | 46221.                | 5745.              | 8.050  | 8.050  |
| T-10.0 | 1-280- 217 | 7398.                 | 941.               | 7.860  | 7.860  |
| T-10.0 | 1-280- 221 | 28142.                | 693.               | 40.590 | 40.590 |
| T-10.0 | 1-280- 222 | 24381.                | 1288.              | 18.940 | 18.940 |
| T-10.0 | 1-280- 223 | 2918.                 | 396.               | 7.370  | 7.370  |
| T-10.0 | 1-280- 224 | 8839.                 | 941.               | 9.390  | 9.390  |
| T-10.0 | 1-280-2111 | 8819.                 | 1139.              | 7.740  | 7.740  |
| T-10.0 | 1-280-2121 | 8819.                 | 1139.              | 7.740  | 7.740  |
| T-10.0 | 1-280-2131 | 8819.                 | 1139.              | 7.740  | 7.740  |
| T-10.0 | 1-280-2141 | 13027.                | 1684.              | 7.740  | 7.740  |
| T-10.0 | 1-536- 1   | 87149.                | 2872.              | 30.340 | 30.340 |
| T-10.0 | 1-536- 2   | 114059.               | 3764.              | 30.300 | 30.300 |
| T-10.0 | 1-536- 3   | 76969.                | 2575.              | 29.890 | 29.890 |
| T-10.0 | 1-536- 4   | 86565.                | 2872.              | 30.140 | 30.140 |
| T-10.0 | 1-536- 8   | 4863.                 | 842.               | 5.780  | 5.780  |
| T-10.0 | 1-536- 9   | 37674.                | 2328.              | 16.190 | 16.190 |

| ECO #  | BUILDING # | DISCOUNTED SAVINGS | INVESTMENT COST | SIR    | ESIR   |
|--------|------------|--------------------|-----------------|--------|--------|
| T-10.0 | 1-536- 12  | 128584.            | 4209.           | 30.550 | 30.550 |
| T-10.0 | 1-536- 16  | 22075.             | 1238.           | 17.830 | 17.830 |
| T-10.0 | 1-536- 17  | 4409.              | 693.            | 6.360  | 6.360  |
| T-10.0 | 1-536- 18  | 3957.              | 495.            | 7.990  | 7.990  |
| T-10.0 | 1-536- 20  | 6290.              | 1486.           | 4.230  | 4.230  |
| T-10.0 | 1-536- 21  | 27838.             | 1684.           | 16.530 | 16.530 |
| T-10.0 | 1-536- 22  | 41370.             | 2030.           | 20.370 | 20.370 |
| T-10.0 | 1-536- 23  | 25874.             | 1585.           | 16.330 | 16.330 |
| T-10.0 | 1-536- 28  | 54601.             | 2625.           | 20.800 | 20.800 |
| T-10.0 | 1-536- 30  | 4522.              | 891.            | 5.070  | 5.070  |
| T-10.0 | 1-536- 31  | 1752.              | 446.            | 3.930  | 3.930  |
| T-10.0 | 1-536- 32  | 1017.              | 248.            | 4.110  | 4.110  |
| T-10.0 | 1-536- 33  | 9673.              | 3665.           | 2.640  | 2.640  |
| T-10.0 | 1-536- 35  | 3391.              | 891.            | 3.800  | 3.800  |
| T-10.0 | 1-536- 36  | 791.               | 248.            | 3.200  | 3.200  |
| T-10.0 | 1-536- 37  | 12718.             | 1486.           | 8.560  | 8.560  |
| T-10.0 | 1-536- 38  | 18935.             | 1238.           | 15.290 | 15.290 |
| T-10.0 | 1-536- 39  | 10287.             | 1585.           | 6.490  | 6.490  |
| T-10.0 | 1-536- 40  | 7009.              | 1387.           | 5.050  | 5.050  |
| T-10.0 | 1-536- 41  | 20687.             | 1040.           | 19.890 | 19.890 |
| T-10.0 | 1-536- 42  | 6218.              | 1238.           | 5.020  | 5.020  |
| T-10.0 | 1-536- 43  | 9100.              | 495.            | 18.380 | 18.380 |
| T-10.0 | 1-536- 44  | 735.               | 198.            | 3.710  | 3.710  |
| T-10.0 | 1-536- 45  | 8309.              | 446.            | 18.640 | 18.640 |
| T-10.0 | 1-536- 46  | 38662.             | 2674.           | 14.460 | 14.460 |
| T-10.0 | 1-536- 47  | 12209.             | 2129.           | 5.730  | 5.730  |
| T-10.0 | 1-536- 48  | 5370.              | 297.            | 18.070 | 18.070 |
| T-10.0 | 1-536- 49  | 10683.             | 545.            | 19.610 | 19.610 |
| T-10.0 | 1-536- 52  | 58162.             | 4011.           | 14.500 | 14.500 |
| T-10.0 | 1-536- 55  | 6161.              | 2229.           | 2.760  | 2.760  |
| T-10.0 | 1-536- 68  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 69  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 70  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 71  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 72  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 73  | 648.               | 198.            | 3.270  | 3.270  |
| T-10.0 | 1-536- 74  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 75  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 76  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 78  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 80  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 83  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 84  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 85  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 86  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536- 87  | 519.               | 198.            | 2.620  | 2.620  |
| T-10.0 | 1-536-2027 | 6750.              | 1288.           | 5.240  | 5.240  |

| ECO #  | BUILDING # | DISCOUNTED<br>SAVINGS | INVESTMENT<br>COST | SIR    | ESIR   |
|--------|------------|-----------------------|--------------------|--------|--------|
| T-10.0 | 1-572- 101 | 15044.                | 2476.              | 6.080  | 6.080  |
| T-10.0 | 1-572- 102 | 7952.                 | 842.               | 9.450  | 9.450  |
| T-10.0 | 1-572- 103 | 18335.                | 1981.              | 9.260  | 9.260  |
| T-10.0 | 1-572- 104 | 5339.                 | 792.               | 6.740  | 6.740  |
| T-10.0 | 1-572- 105 | 4152.                 | 644.               | 6.450  | 6.450  |
| T-10.0 | 1-572- 106 | 17770.                | 2427.              | 7.320  | 7.320  |
| T-10.0 | 1-572- 107 | 9309.                 | 1288.              | 7.230  | 7.230  |
| T-10.0 | 1-572- 108 | 15270.                | 2129.              | 7.170  | 7.170  |
| T-10.0 | 1-572- 110 | 17035.                | 3268.              | 5.210  | 5.210  |
| T-10.0 | 1-572- 111 | 54554.                | 5547.              | 9.840  | 9.840  |
| T-10.0 | 1-572- 112 | 11018.                | 1585.              | 6.950  | 6.950  |
| T-10.0 | 1-572- 113 | 5735.                 | 842.               | 6.810  | 6.810  |
| T-10.0 | 1-572- 114 | 4474.                 | 347.               | 12.910 | 12.910 |
| T-10.0 | 1-572- 115 | 21269.                | 2625.              | 8.100  | 8.100  |
| T-10.0 | 1-572- 116 | 116004.               | 5646.              | 20.550 | 20.550 |
| T-10.0 | 1-572- 118 | 19583.                | 2971.              | 6.590  | 6.590  |
| T-10.0 | 1-572- 119 | 5966.                 | 446.               | 13.380 | 13.380 |
| T-10.0 | 1-572- 120 | 26780.                | 3268.              | 8.190  | 8.190  |
| T-10.0 | 1-572- 121 | 97200.                | 4754.              | 20.450 | 20.450 |
| T-10.0 | 1-572- 122 | 15822.                | 1486.              | 10.650 | 10.650 |
| T-10.0 | 1-572- 123 | 35728.                | 3268.              | 10.930 | 10.930 |
| T-10.0 | 1-572- 124 | 12670.                | 3219.              | 3.940  | 3.940  |
| T-10.0 | 1-572- 126 | 12670.                | 3268.              | 3.880  | 3.880  |
| T-10.0 | 1-572- 127 | 2217.                 | 347.               | 6.400  | 6.400  |
| T-10.0 | 1-572- 128 | 12670.                | 3268.              | 3.880  | 3.880  |
| T-10.0 | 1-572- 130 | 7613.                 | 1486.              | 5.120  | 5.120  |
| T-10.0 | 1-572- 131 | 12670.                | 3268.              | 3.880  | 3.880  |
| T-10.0 | 1-572- 132 | 8559.                 | 2427.              | 3.530  | 3.530  |
| T-10.0 | 1-572- 133 | 2227.                 | 594.               | 3.750  | 3.750  |
| T-10.0 | 1-572- 134 | 16118.                | 2328.              | 6.920  | 6.920  |
| T-10.0 | 1-572- 135 | 5057.                 | 1832.              | 2.760  | 2.760  |
| T-10.0 | 1-572- 136 | 3404.                 | 941.               | 3.620  | 3.620  |
| T-10.0 | 1-572- 140 | 8041.                 | 495.               | 16.240 | 16.240 |
| T-10.0 | 1-572- 141 | 8948.                 | 545.               | 16.430 | 16.430 |
| T-10.0 | 1-572- 142 | 6030.                 | 396.               | 15.220 | 15.220 |
| T-10.0 | 1-572- 143 | 14460.                | 396.               | 36.500 | 36.500 |
| T-10.0 | 1-572- 144 | 4522.                 | 545.               | 8.300  | 8.300  |
| T-10.0 | 1-572- 145 | 2464.                 | 248.               | 9.950  | 9.950  |
| T-10.0 | 1-572- 146 | 90132.                | 2971.              | 30.330 | 30.330 |
| T-10.0 | 1-572- 147 | 14006.                | 792.               | 17.680 | 17.680 |
| T-10.0 | 1-572- 148 | 6670.                 | 2971.              | 2.240  | 2.240  |
| T-10.0 | 1-572- 149 | 52566.                | 3516.              | 14.950 | 14.950 |
| T-10.0 | 1-572- 150 | 52566.                | 3516.              | 14.950 | 14.950 |
| T-10.0 | 1-572- 151 | 10344.                | 4606.              | 2.250  | 2.250  |
| T-10.0 | 1-572- 152 | 7926.                 | 3516.              | 2.250  | 2.250  |
| T-10.0 | 1-572- 153 | 452.                  | 248.               | 1.830  | 1.830  |
| T-10.0 | 1-572- 154 | 7926.                 | 3516.              | 2.250  | 2.250  |

| ECO #  | BUILDING # | DISCOUNTED<br>SAVINGS | INVESTMENT<br>COST | SIR    | ESIR   |
|--------|------------|-----------------------|--------------------|--------|--------|
| T-10.0 | 1-572- 155 | 7926.                 | 3516.              | 2.250  | 2.250  |
| T-10.0 | 1-572- 156 | 9792.                 | 4308.              | 2.270  | 2.270  |
| T-10.0 | 1-572- 157 | 15951.                | 3516.              | 4.540  | 4.540  |
| T-10.0 | 1-572- 158 | 18804.                | 1585.              | 11.870 | 11.870 |
| T-10.0 | 1-572- 159 | 16600.                | 446.               | 37.240 | 37.240 |
| T-10.0 | 1-572- 162 | 2399.                 | 149.               | 16.150 | 16.150 |
| T-10.0 | 1-572- 163 | 2939.                 | 792.               | 3.710  | 3.710  |
| T-10.0 | 1-572- 165 | 12605.                | 2030.              | 6.210  | 6.210  |
| T-10.0 | 1-572- 166 | 3955.                 | 545.               | 7.260  | 7.260  |
| T-10.0 | 1-572- 167 | 14655.                | 743.               | 19.730 | 19.730 |
| T-10.0 | 1-572- 168 | 3131.                 | 297.               | 10.540 | 10.540 |
| T-10.0 | 1-572- 170 | 2018.                 | 297.               | 6.790  | 6.790  |
| T-10.0 | 1-572- 171 | 2366.                 | 347.               | 6.830  | 6.830  |
| T-10.0 | 1-572- 175 | 15368.                | 1089.              | 14.110 | 14.110 |
| T-10.0 | 1-572- 180 | 14914.                | 2575.              | 5.790  | 5.790  |
| T-10.0 | 1-572- 181 | 16284.                | 941.               | 17.310 | 17.310 |
| T-10.0 | 1-572- 182 | 16284.                | 941.               | 17.310 | 17.310 |
| T-10.0 | 1-572- 183 | 12456.                | 941.               | 13.240 | 13.240 |
| T-10.0 | 1-572- 184 | 30897.                | 2278.              | 13.560 | 13.560 |
| T-10.0 | 1-572- 186 | 37230.                | 3665.              | 10.160 | 10.160 |
| T-10.0 | 1-862- 555 | 25434.                | 1486.              | 17.120 | 17.120 |
| T-10.0 | 1-863- 57  | 1602.                 | 149.               | 10.780 | 10.780 |
| T-10.0 | 1-863- 60  | 19026.                | 4705.              | 4.040  | 4.040  |
| T-10.0 | 1-863- 61  | 29790.                | 3863.              | 7.710  | 7.710  |
| T-10.0 | 1-863- 62  | 20678.                | 2724.              | 7.590  | 7.590  |
| T-10.0 | 1-863- 63  | 48155.                | 7280.              | 6.610  | 6.610  |
| T-10.0 | 1-863- 64  | 9162.                 | 1238.              | 7.400  | 7.400  |
| T-10.0 | 1-863- 65  | 28338.                | 3714.              | 7.630  | 7.630  |
| T-10.0 | 1-863- 66  | 2654.                 | 396.               | 6.700  | 6.700  |
| T-10.0 | 1-863- 67  | 21329.                | 2823.              | 7.560  | 7.560  |
| T-10.0 | 1-863- 91  | 32444.                | 2476.              | 13.100 | 13.100 |
| T-10.0 | 1-863- 95  | 1051.                 | 149.               | 7.080  | 7.080  |
| T-11.0 | 1- 7- 440  | 13098.                | 1986.              | 6.590  | 6.590  |
| T-11.0 | 1-536- 8   | 21204.                | 1986.              | 10.680 | 10.680 |
| T-11.0 | 1-536- 10  | 21463.                | 1986.              | 10.810 | 10.810 |
| T-11.0 | 1-536- 13  | 33848.                | 1986.              | 17.040 | 17.040 |
| T-11.0 | 1-536- 17  | 20179.                | 1986.              | 10.160 | 10.160 |
| T-11.0 | 1-536- 20  | 23927.                | 3972.              | 6.020  | 6.020  |
| T-11.0 | 1-536- 33  | 36882.                | 5959.              | 6.190  | 6.190  |
| T-11.0 | 1-536- 34  | 11135.                | 1986.              | 5.610  | 5.610  |
| T-11.0 | 1-536- 35  | 8139.                 | 1986.              | 4.100  | 4.100  |
| T-11.0 | 1-536- 38  | 39283.                | 1986.              | 19.780 | 19.780 |
| T-11.0 | 1-536- 39  | 48497.                | 3972.              | 12.210 | 12.210 |
| T-11.0 | 1-536- 47  | 14244.                | 3972.              | 3.590  | 3.590  |
| T-11.0 | 1-536- 68  | 2140.                 | 1986.              | 1.080  | 1.080  |
| T-11.0 | 1-536- 69  | 2140.                 | 1986.              | 1.080  | 1.080  |
| T-11.0 | 1-536- 70  | 2140.                 | 1986.              | 1.080  | 1.080  |

| ECO #  | BUILDING # | DISCOUNTED SAVINGS | INVESTMENT COST | SIR    | ESIR   |
|--------|------------|--------------------|-----------------|--------|--------|
| T-11.0 | 1-536- 71  | 2140.              | 1986.           | 1.080  | 1.080  |
| T-11.0 | 1-536- 72  | 2140.              | 1986.           | 1.080  | 1.080  |
| T-11.0 | 1-536- 73  | 2464.              | 1986.           | 1.240  | 1.240  |
| T-11.0 | 1-536- 74  | 2140.              | 1986.           | 1.080  | 1.080  |
| T-11.0 | 1-536- 75  | 2140.              | 1986.           | 1.080  | 1.080  |
| T-11.0 | 1-536- 76  | 2140.              | 1986.           | 1.080  | 1.080  |
| T-11.0 | 1-536- 78  | 2140.              | 1986.           | 1.080  | 1.080  |
| T-11.0 | 1-536- 80  | 2140.              | 1986.           | 1.080  | 1.080  |
| T-11.0 | 1-536- 83  | 2140.              | 1986.           | 1.080  | 1.080  |
| T-11.0 | 1-536- 84  | 2140.              | 1986.           | 1.080  | 1.080  |
| T-11.0 | 1-536- 85  | 2140.              | 1986.           | 1.080  | 1.080  |
| T-11.0 | 1-536- 86  | 2140.              | 1986.           | 1.080  | 1.080  |
| T-11.0 | 1-536- 87  | 2140.              | 1986.           | 1.080  | 1.080  |
| T-11.0 | 1-536- 88  | 11552.             | 1986.           | 5.820  | 5.820  |
| T-11.0 | 1-572- 101 | 11244.             | 3972.           | 2.830  | 2.830  |
| T-11.0 | 1-572- 104 | 7205.              | 1986.           | 3.630  | 3.630  |
| T-11.0 | 1-572- 105 | 5565.              | 1986.           | 2.800  | 2.800  |
| T-11.0 | 1-572- 106 | 16005.             | 3972.           | 4.030  | 4.030  |
| T-11.0 | 1-572- 107 | 8405.              | 3972.           | 2.120  | 2.120  |
| T-11.0 | 1-572- 108 | 13800.             | 3972.           | 3.470  | 3.470  |
| T-11.0 | 1-572- 112 | 14818.             | 3972.           | 3.730  | 3.730  |
| T-11.0 | 1-572- 113 | 7783.              | 1986.           | 3.920  | 3.920  |
| T-11.0 | 1-572- 114 | 6030.              | 1986.           | 3.040  | 3.040  |
| T-11.0 | 1-572- 115 | 12320.             | 3972.           | 3.100  | 3.100  |
| T-11.0 | 1-572- 118 | 20685.             | 3972.           | 5.210  | 5.210  |
| T-11.0 | 1-572- 119 | 5382.              | 1986.           | 2.710  | 2.710  |
| T-11.0 | 1-572- 120 | 15497.             | 3972.           | 3.900  | 3.900  |
| T-11.0 | 1-572- 124 | 7261.              | 3972.           | 1.830  | 1.830  |
| T-11.0 | 1-572- 126 | 7374.              | 3972.           | 1.860  | 1.860  |
| T-11.0 | 1-572- 127 | 2048.              | 1986.           | 1.030  | 1.030  |
| T-11.0 | 1-572- 128 | 7374.              | 3972.           | 1.860  | 1.860  |
| T-11.0 | 1-572- 131 | 7374.              | 3972.           | 1.860  | 1.860  |
| T-11.0 | 1-572- 133 | 2366.              | 1986.           | 1.190  | 1.190  |
| T-11.0 | 1-572- 134 | 21740.             | 3972.           | 5.470  | 5.470  |
| T-11.0 | 1-572- 135 | 21796.             | 3972.           | 5.490  | 5.490  |
| T-11.0 | 1-572- 145 | 2205.              | 1986.           | 1.110  | 1.110  |
| T-11.0 | 1-572- 158 | 21917.             | 3972.           | 5.520  | 5.520  |
| T-11.0 | 1-572- 165 | 9383.              | 3972.           | 2.360  | 2.360  |
| T-11.0 | 1-572- 170 | 9325.              | 1986.           | 4.690  | 4.690  |
| T-11.0 | 1-572- 171 | 10995.             | 1986.           | 5.540  | 5.540  |
| T-11.0 | 1-572- 175 | 20685.             | 1986.           | 10.410 | 10.410 |
| T-11.0 | 1-572- 176 | 52653.             | 1986.           | 26.510 | 26.510 |
| T-11.0 | 1-572- 177 | 67177.             | 1986.           | 33.820 | 33.820 |
| T-11.0 | 1-572- 178 | 41889.             | 1986.           | 21.090 | 21.090 |
| T-11.0 | 1-572- 183 | 4732.              | 1986.           | 2.380  | 2.380  |
| T-11.0 | 1-572- 184 | 11760.             | 3972.           | 2.960  | 2.960  |
| T-12.0 | 1-536- 10  | 7262.              | 1359.           | 5.340  | 5.340  |

| ECO #  | BUILDING # |     | DISCOUNTED SAVINGS | INVESTMENT COST | SIR    | ESIR   |
|--------|------------|-----|--------------------|-----------------|--------|--------|
| T-12.0 | 1-536-     | 13  | 10505.             | 1359.           | 7.730  | 7.730  |
| T-12.0 | 1-536-     | 24  | 8309.              | 2718.           | 3.060  | 3.060  |
| T-12.0 | 1-536-     | 25  | 42505.             | 2718.           | 15.640 | 15.640 |
| T-12.0 | 1-536-     | 26  | 8309.              | 2718.           | 3.060  | 3.060  |
| T-12.0 | 1-536-     | 27  | 8309.              | 2718.           | 3.060  | 3.060  |
| T-12.0 | 1-536-     | 29  | 10570.             | 2718.           | 3.890  | 3.890  |
| T-12.0 | 1-536-     | 34  | 3731.              | 1359.           | 2.740  | 2.740  |
| T-12.0 | 1-536-     | 54  | 5539.              | 2718.           | 2.040  | 2.040  |
| T-12.0 | 1-536-     | 88  | 3619.              | 1359.           | 2.660  | 2.660  |
| T-12.0 | 1-572-     | 176 | 16405.             | 1359.           | 12.070 | 12.070 |
| T-12.0 | 1-572-     | 177 | 20879.             | 1359.           | 15.360 | 15.360 |
| T-12.0 | 1-572-     | 178 | 13033.             | 1359.           | 9.590  | 9.590  |
| TOTAL  |            |     | 4120861.           | 478736.         | 8.608  | 8.608  |

DEFINITION OF ECO CODES:

T-10.0 THERMOSTATIC RAD. CONTROL VALVES

T-11.0 NIGHT SETBACK CONTROLS

T-12.0 OUTSIDE AIR RESET CONTROLS

PROJECT LISTING FOR PACKAGE # 6: F/H TEMPERATURE CONTROLS

| ECO #  | BUILDING # |     | DISCOUNTED SAVINGS | INVESTMENT COST | SIR    | ESIR   |
|--------|------------|-----|--------------------|-----------------|--------|--------|
| H- 9.0 | 1-187-     | 748 | 587716.            | 158452.         | 3.710  | 3.710  |
| H- 9.5 | 1-187-     | 748 | 217974.            | 8895.           | 24.500 | 24.500 |
| T-10.0 | 1-187-     | 701 | 2659.              | 198.            | 13.420 | 13.420 |
| T-10.0 | 1-187-     | 702 | 2659.              | 198.            | 13.420 | 13.420 |
| T-10.0 | 1-187-     | 703 | 2659.              | 198.            | 13.420 | 13.420 |
| T-10.0 | 1-187-     | 704 | 2659.              | 198.            | 13.420 | 13.420 |
| T-10.0 | 1-187-     | 705 | 2659.              | 198.            | 13.420 | 13.420 |
| T-10.0 | 1-187-     | 706 | 2659.              | 198.            | 13.420 | 13.420 |
| T-10.0 | 1-187-     | 707 | 2659.              | 198.            | 13.420 | 13.420 |
| T-10.0 | 1-187-     | 708 | 2659.              | 198.            | 13.420 | 13.420 |
| T-10.0 | 1-187-     | 709 | 2659.              | 198.            | 13.420 | 13.420 |
| T-10.0 | 1-187-     | 710 | 7781.              | 347.            | 22.450 | 22.450 |
| T-10.0 | 1-187-     | 711 | 7781.              | 347.            | 22.450 | 22.450 |
| T-10.0 | 1-187-     | 712 | 7781.              | 347.            | 22.450 | 22.450 |
| T-10.0 | 1-187-     | 713 | 7781.              | 347.            | 22.450 | 22.450 |
| T-10.0 | 1-187-     | 714 | 7781.              | 347.            | 22.450 | 22.450 |
| T-10.0 | 1-187-     | 715 | 7781.              | 347.            | 22.450 | 22.450 |



| ECO #  | BUILDING # | DISCOUNTED<br>SAVINGS | INVESTMENT<br>COST | SIR    | ESIR   |
|--------|------------|-----------------------|--------------------|--------|--------|
| T-10.0 | 1-187- 716 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 717 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 718 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 719 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 720 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 721 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 722 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 723 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 724 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 725 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 726 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 727 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 728 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 729 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 730 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 731 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 732 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 733 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 734 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 735 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 736 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 737 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 738 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 739 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 740 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 741 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 742 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 743 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 744 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 745 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 746 | 7781.                 | 347.               | 22.450 | 22.450 |
| T-10.0 | 1-187- 747 | 14006.                | 2080.              | 6.730  | 6.730  |
| T-10.0 | 1-187- 748 | 14006.                | 2080.              | 6.730  | 6.730  |
| T-10.0 | 1-862- 578 | 11165.                | 1436.              | 7.770  | 7.770  |
| T-12.0 | 1-159- 505 | 15044.                | 2718.              | 5.530  | 5.530  |
| T-12.0 | 1-159- 506 | 15044.                | 2718.              | 5.530  | 5.530  |
| T-12.0 | 1-159- 507 | 13812.                | 2718.              | 5.080  | 5.080  |
| T-12.0 | 1-159- 508 | 13812.                | 2718.              | 5.080  | 5.080  |
| T-12.0 | 1-159- 509 | 13812.                | 2718.              | 5.080  | 5.080  |
| T-12.0 | 1-159- 510 | 15044.                | 2718.              | 5.530  | 5.530  |
| T-12.0 | 1-159- 511 | 21917.                | 2718.              | 8.060  | 8.060  |
| T-12.0 | 1-159- 512 | 9255.                 | 2718.              | 3.400  | 3.400  |
| T-12.0 | 1-159- 513 | 15044.                | 2718.              | 5.530  | 5.530  |
| T-12.0 | 1-159- 514 | 13812.                | 2718.              | 5.080  | 5.080  |
| T-12.0 | 1-159- 516 | 13812.                | 2718.              | 5.080  | 5.080  |
| T-12.0 | 1-159- 517 | 13812.                | 2718.              | 5.080  | 5.080  |
| T-12.0 | 1-159- 518 | 15044.                | 2718.              | 5.530  | 5.530  |

| ECO #  | BUILDING # | DISCOUNTED<br>SAVINGS | INVESTMENT<br>COST | SIR   | ESIR  |
|--------|------------|-----------------------|--------------------|-------|-------|
| T-12.0 | 1-159- 519 | 15044.                | 2718.              | 5.530 | 5.530 |
| T-12.0 | 1-159- 520 | 15044.                | 2718.              | 5.530 | 5.530 |
| T-12.0 | 1-159- 521 | 15044.                | 2718.              | 5.530 | 5.530 |
| T-12.0 | 1-159- 523 | 15044.                | 2718.              | 5.530 | 5.530 |
| T-12.0 | 1-159- 524 | 13812.                | 2718.              | 5.080 | 5.080 |
| T-12.0 | 1-159- 525 | 13812.                | 2718.              | 5.080 | 5.080 |
| T-12.0 | 1-159- 526 | 21917.                | 2718.              | 8.060 | 8.060 |
| T-12.0 | 1-159- 529 | 14539.                | 2718.              | 5.350 | 5.350 |
| T-12.0 | 1-159- 530 | 15044.                | 2718.              | 5.530 | 5.530 |
| T-12.0 | 1-159- 531 | 13500.                | 2718.              | 4.970 | 4.970 |
| T-12.0 | 1-159- 532 | 16016.                | 2718.              | 5.890 | 5.890 |
| T-12.0 | 1-159- 533 | 10634.                | 2718.              | 3.910 | 3.910 |
| T-12.0 | 1-862- 534 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 536 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 537 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 538 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 539 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 540 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 541 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 542 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 543 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 544 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 545 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 546 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 547 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 548 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 549 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 550 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 551 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 552 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 553 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 554 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 556 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 557 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 558 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 559 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 560 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 561 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 562 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 563 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 564 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 565 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 566 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 567 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 568 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 569 | 16322.                | 2718.              | 6.000 | 6.000 |
| T-12.0 | 1-862- 570 | 16322.                | 2718.              | 6.000 | 6.000 |

| ECO #  | BUILDING # | DISCOUNTED SAVINGS | INVESTMENT COST | SIR   | ESIR  |
|--------|------------|--------------------|-----------------|-------|-------|
| T-12.0 | 1-862- 571 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-862- 572 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-862- 573 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-862- 574 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-862- 575 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-862- 576 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-862- 577 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-862- 579 | 13418.             | 2718.           | 4.940 | 4.940 |
| T-12.0 | 1-864- 603 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 604 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 605 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 606 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 607 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 608 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 609 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 610 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 611 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 612 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 613 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 614 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 615 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 616 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 617 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 618 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 619 | 16322.             | 2718.           | 6.000 | 6.000 |
| T-12.0 | 1-864- 620 | 16322.             | 2718.           | 6.000 | 6.000 |
| TOTAL  |            | 2518147.           | 421312.         | 5.978 | 5.978 |

DEFINITION OF ECO CODES:

H- 9.0 PIPE INSULATION

H- 9.5 INSULATE VALVES & FITTINGS

T-10.0 THERMOSTATIC RAD. CONTROL VALVES

T-12.0 OUTSIDE AIR RESET CONTROLS

PROJECT LISTING PACKAGE # 7: SCHOOL BUILDING MODS.

| ECO #  | BUILDING # | DISCOUNTED SAVINGS | INVESTMENT COST | SIR    | ESIR   |
|--------|------------|--------------------|-----------------|--------|--------|
| B-18.0 | 1-159- 528 | 24934.             | 2229.           | 11.190 | 11.190 |
| B-18.0 | 1-159- 591 | 16622.             | 1486.           | 11.190 | 11.190 |
| L-12.0 | 1-159- 591 | 103967.            | 18214.          | 5.710  | 5.710  |

| ECO #  | BUILDING # | DISCOUNTED<br>SAVINGS | INVESTMENT<br>COST | SIR   | ESIR  |
|--------|------------|-----------------------|--------------------|-------|-------|
| T-10.0 | 1-159- 528 | 70144.                | 7626.              | 9.200 | 9.200 |
| T-10.0 | 1-159- 591 | 57077.                | 6240.              | 9.150 | 9.150 |
| T-10.0 | 1-536- 56  | 5539.                 | 2030.              | 2.730 | 2.730 |
| T-10.0 | 1-536-2003 | 2366.                 | 347.               | 6.830 | 6.830 |
| T-10.0 | 1-536-2004 | 1670.                 | 248.               | 6.740 | 6.740 |
| T-10.0 | 1-862- 581 | 19476.                | 2179.              | 8.940 | 8.940 |
| W- 2.0 | 1-536-2004 | 2529.                 | 369.               | 6.860 | 6.860 |
| W- 6.0 | 1-159- 528 | 1895.                 | 411.               | 4.610 | 4.610 |
| W- 6.0 | 1-159- 591 | 1509.                 | 411.               | 3.670 | 3.670 |
| W- 6.0 | 1-862- 581 | 441.                  | 137.               | 3.220 | 3.220 |
| TOTAL  |            | 308169.               | 41927.             | 7.350 | 7.350 |

DEFINITION OF ECO CODES:

B-18.0 SEAL LOADING DOCK DOORS  
L-12.0 REPLACE INCAND. LIGHTS W/ FLOUR.  
T-10.0 THERMOSTATIC RAD. CONTROL VALVES  
W- 2.0 INSULATE DOMESTIC HOT WATER LINES  
W- 6.0 TIME CLOCKS FOR DOM. WATER PUMPS

V. CONCLUSIONS:

It is recommended that the package previously outlined be outlined be implemented. Each task included in this package will improve the buildings' energy consumption efficiencies in a cost effective manner, which is in compliance with the Army's "Energy Conservation Investment Program." Implementation of this package will allow Augsburg Military Community to meet their energy conservation goals. It is projected that implementation of this project will reduce energy use by 28.1% when compared to the 1983 reported energy consumption.

The following table outlines the savings and costs attributable to this package:

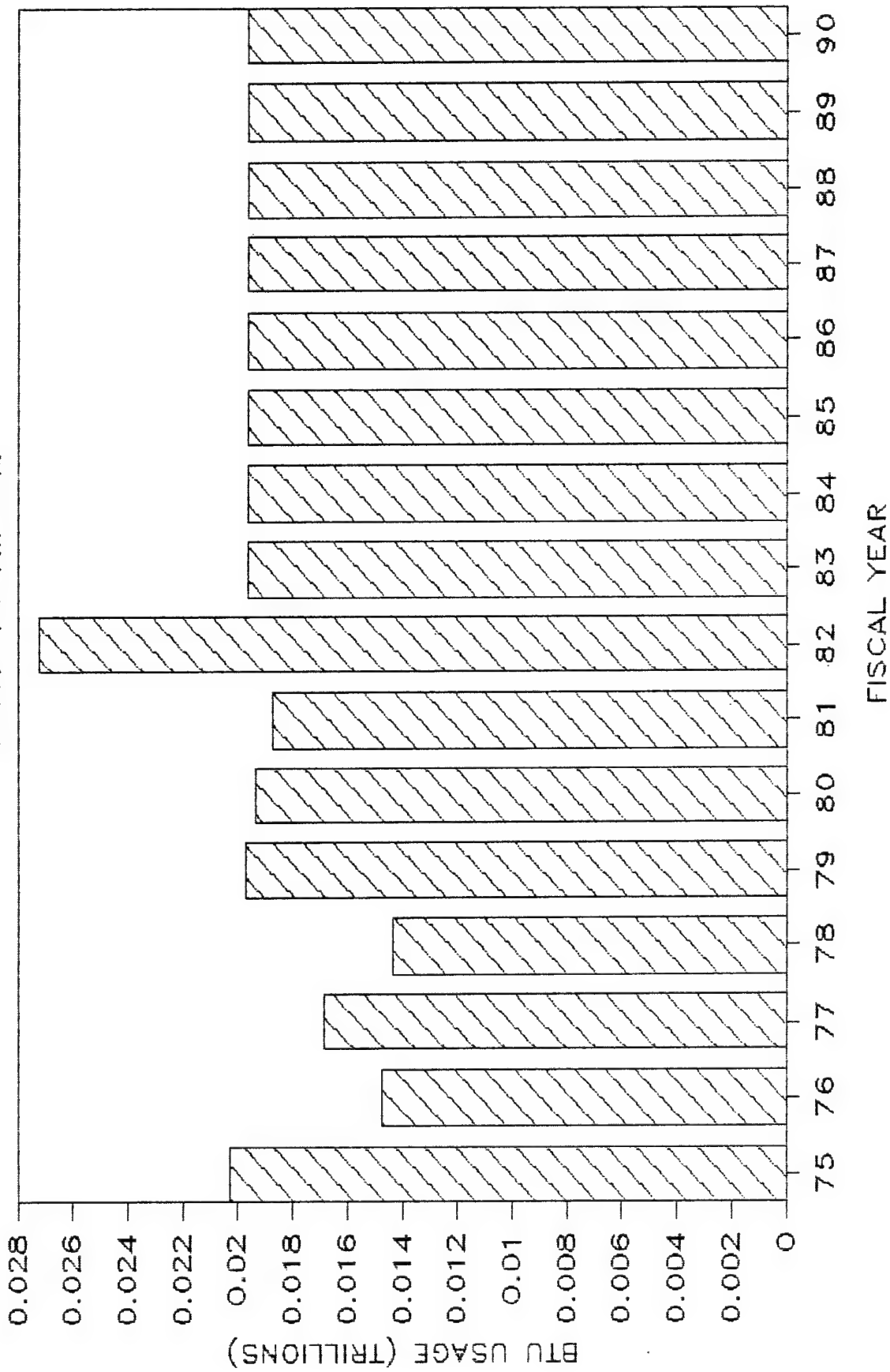
SUMMARY TABLE

|            | Annual<br>Savings \$ | Discounted<br>Savings \$ | Total<br>Cost \$ | SIR    |
|------------|----------------------|--------------------------|------------------|--------|
| Package #1 | 73,183               | 1,095,549                | 805,772          | 1.360  |
| Package #2 | 980,072              | 10,912,287               | 885,398          | 12.320 |
| Package #3 | 364,970              | 5,751,867                | 1,301,891        | 4.418  |
| Package #4 | 452,685              | 5,833,580                | 703,373          | 8.294  |
| Package #5 | 368,045              | 4,120,861                | 478,736          | 8.608  |
| Package #6 | 214,632              | 2,518,147                | 421,312          | 5.978  |
| Package #7 | 27,871               | 308,169                  | 41,927           | 7.350  |

The following graphs predict the energy consumption and cost if all seven packages are funded. For the first six graphs, showing projected energy consumption for Augsburg, it can be seen that actual fuel consumption was used for fiscal years 1975 through 1983. However, for years 1983-1988 straight line projections are shown utilizing 1983 data. The 1983 data was used because this is the last year for which detailed utility data was collected in our Phase I Data Report. The energy savings were distributed evenly for fiscal years 1989 and 1990, as would be anticipated if construction begins in 1989. Actual fuel costs are used for years 1983-1985. However, fuel cost projections for years 1986-1990 were difficult to affix. For example, the fuel costs of electricity went down from 1983 to 1984 and then again for 1984 to 1985. It is our opinion that this trend could not continue. Therefore, we used the 1985 costs to project the energy costs through 1990. The same situation occurred with coal prices. However, for years 1986-1990, the 1985 coal price/ton was used while inflating the shipping costs 5%/year. The #2 oil costs went down from 1983 to 1984 and increased from 1984 to 1985. Therefore, the costs used for years 1986-1990 equals the 1985 oil cost.

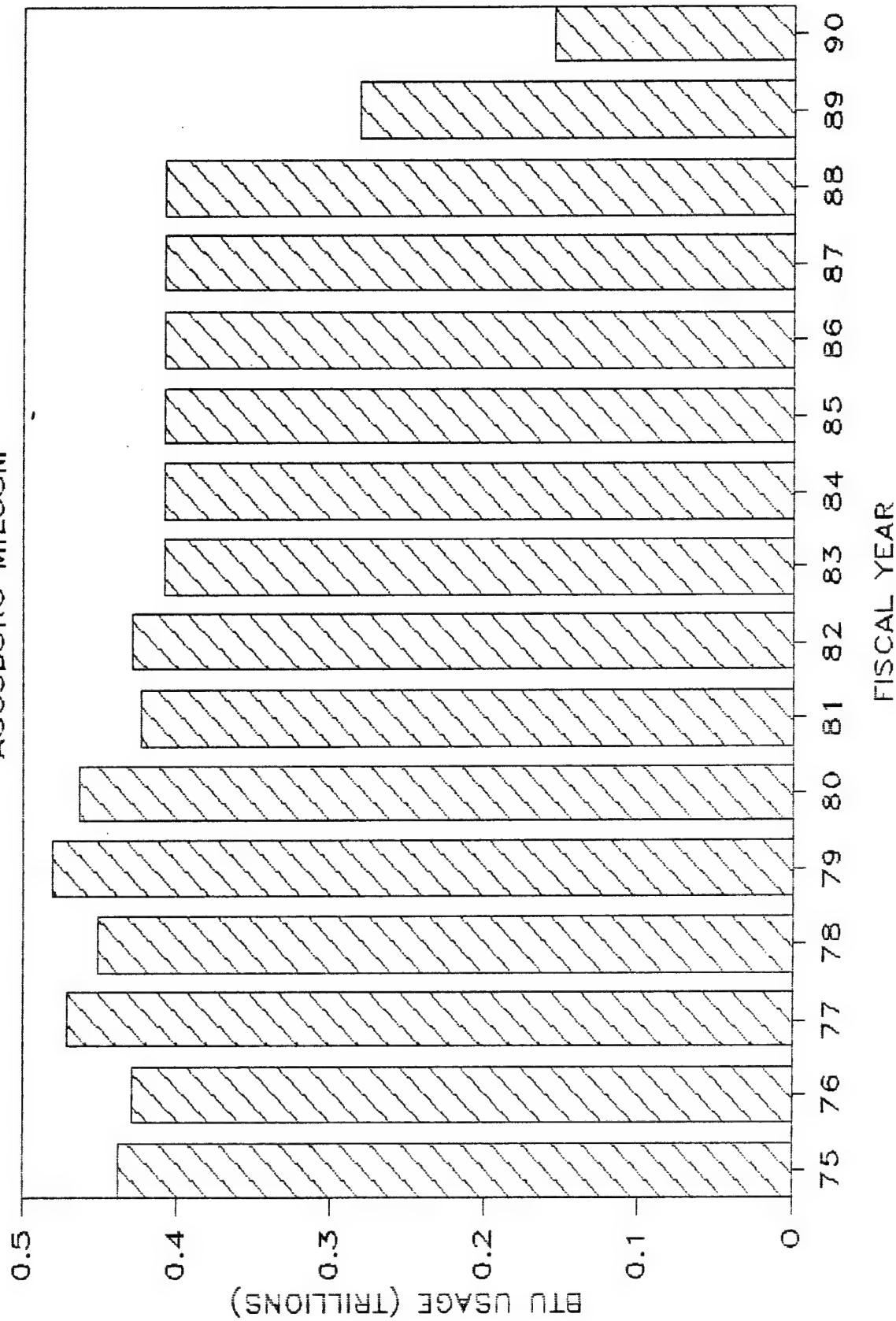
# PROJECTED NATURAL GAS USE

AUGSBURG MILCOM



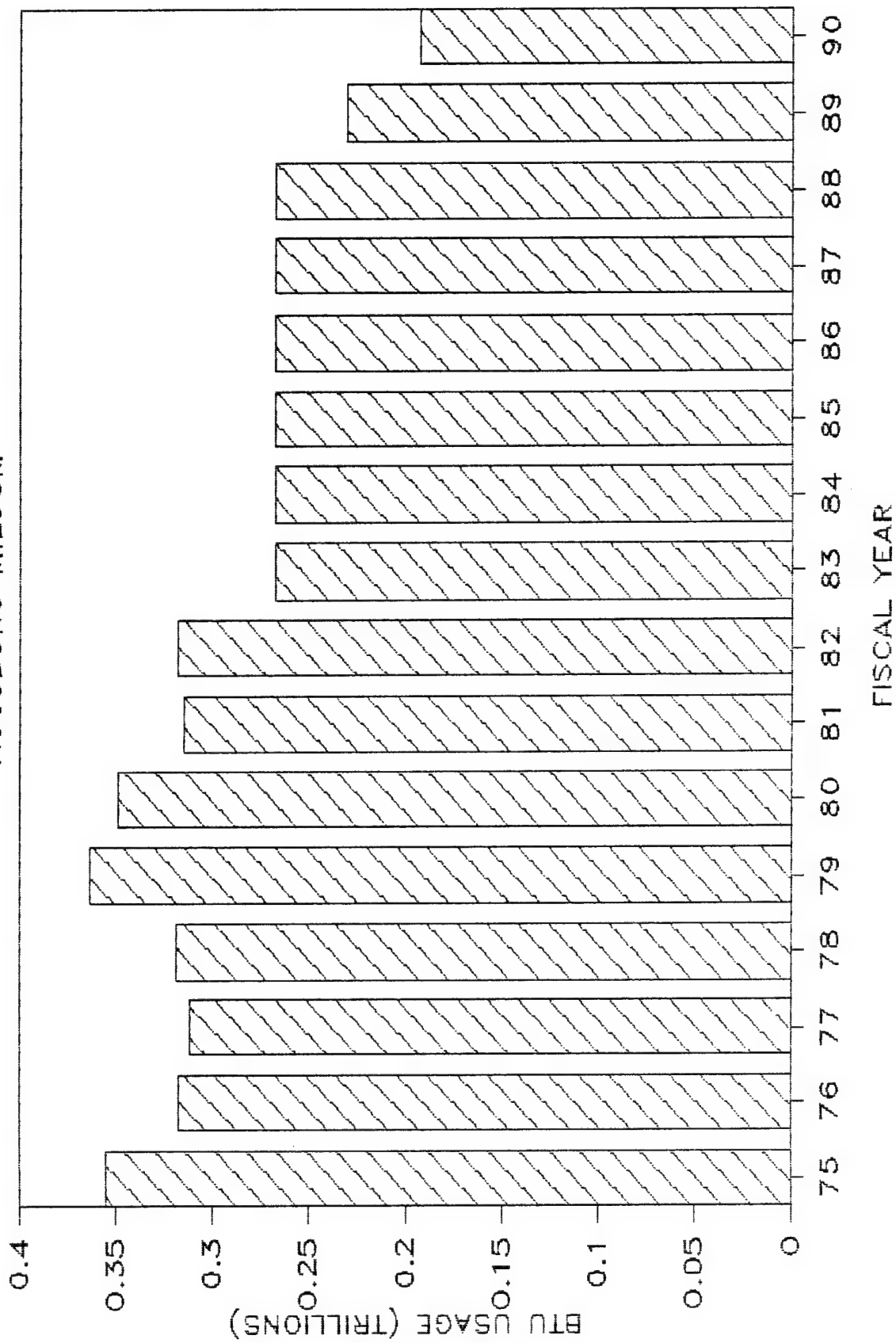
# PROJECTED ANTHRACITE COAL USE

## AUGSBURG MILCOM



# PROJECTED BITUMINOUS COAL USE

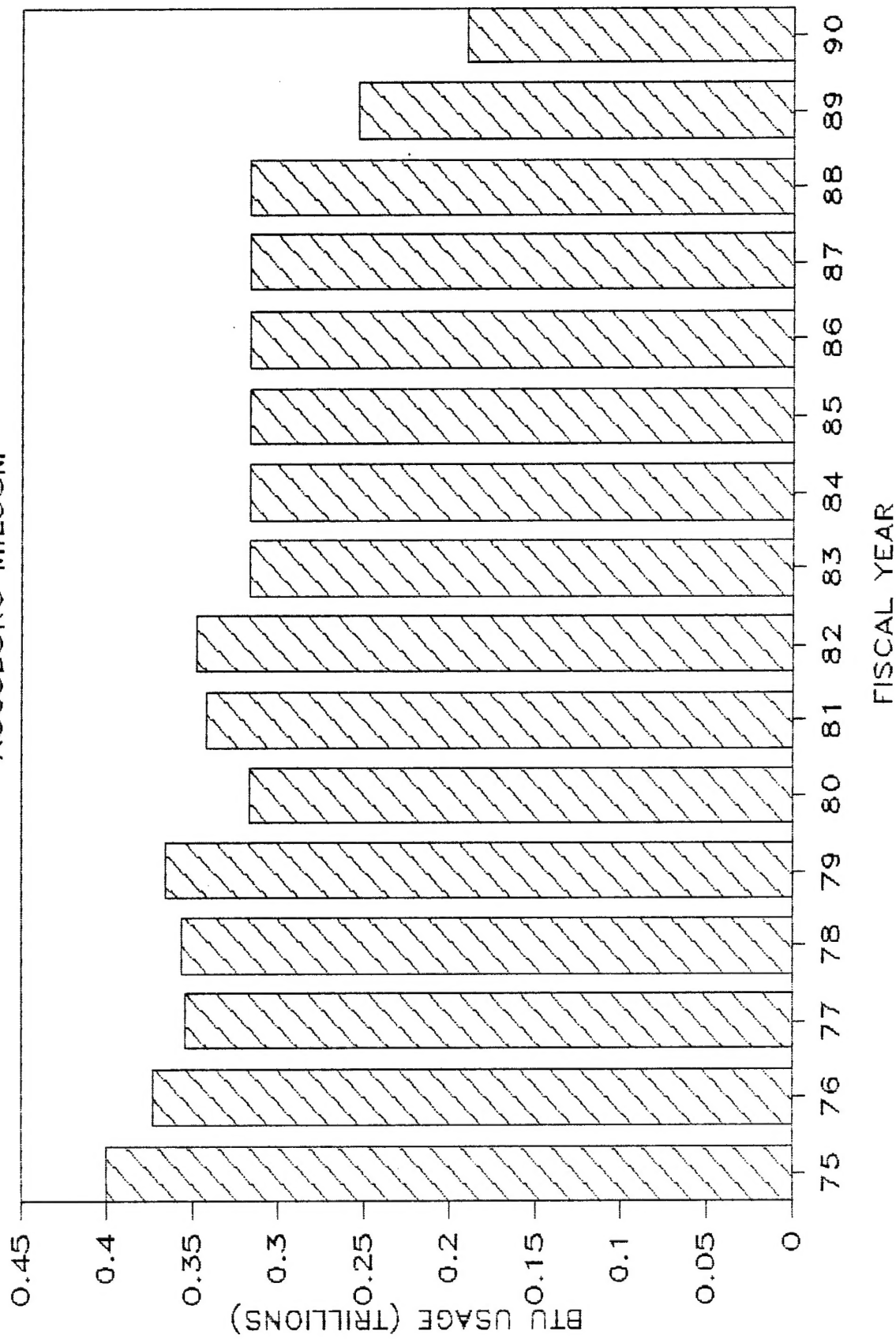
## AUGSBURG MILCOM





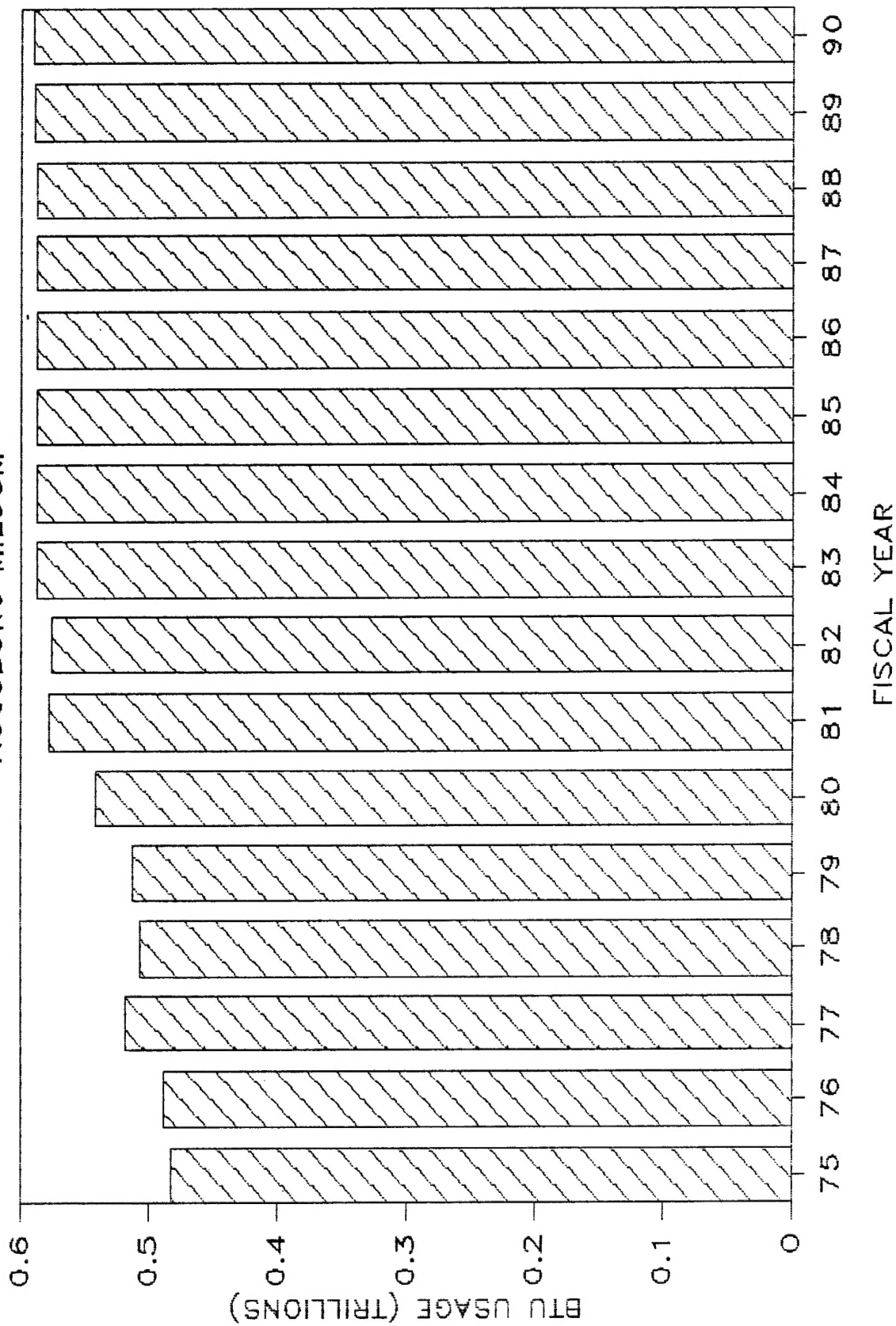
# PROJECTED FUEL OIL USE

AUGSBURG MILCOM



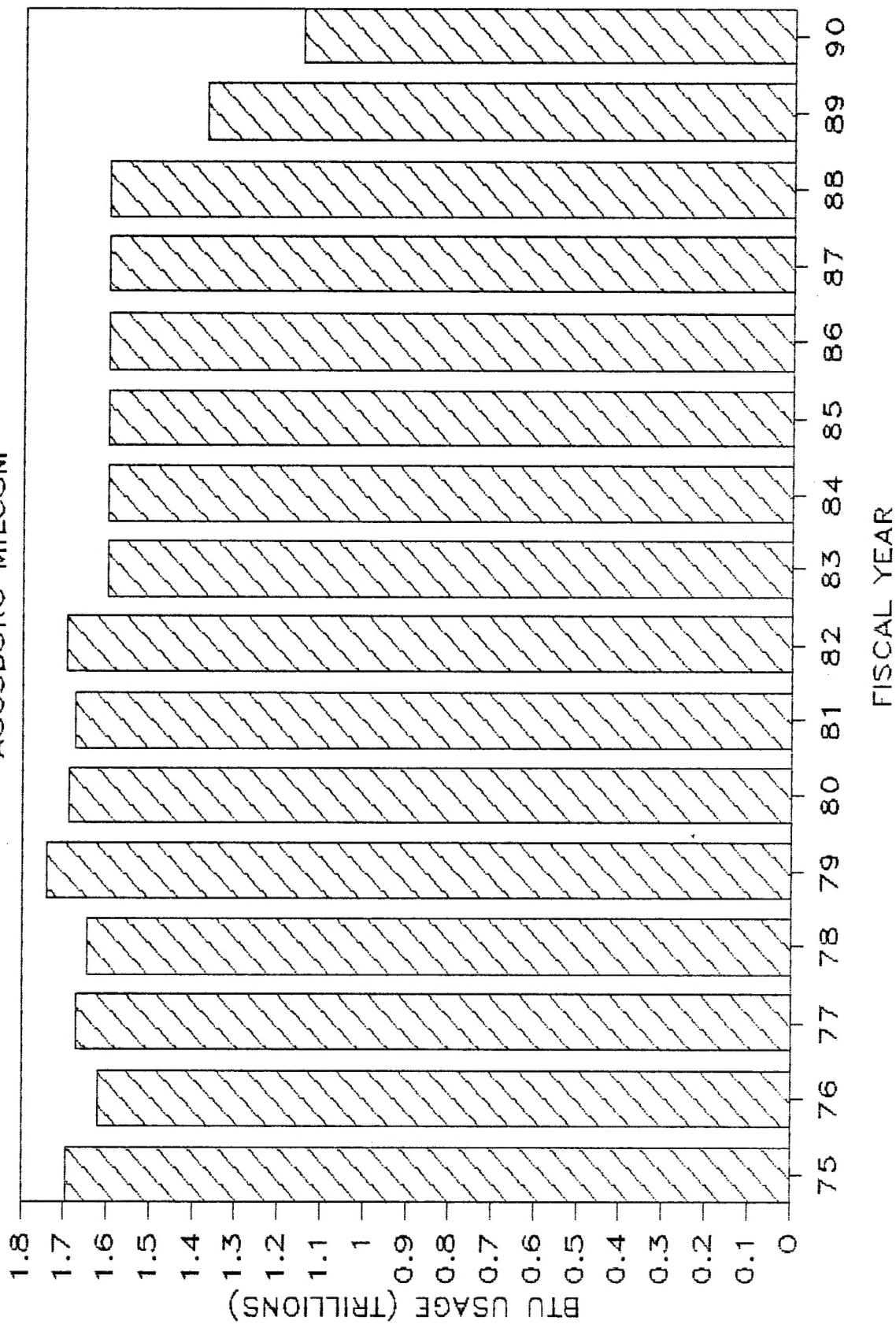
# PROJECTED ELECTRIC USE

AUGSBURG MILCOM



# PROJECTED TOTAL ENERGY USE

AUGSBURG MILCOM



# PROJECTED TOTAL ENERGY COST

AUGSBURG MILCOM

